SERIES 3—Vol. 1, No. 10 OCTOBER, 1918

AMERICAN JOURNAL OF OPHTHALMOLOGY

Incorporating — Established by

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.....Adolf Alt 1884
THE OPHTHALMIC RECORD.....Giles C. Savage 1891
ANNALS of OPHTHALMOLOGY.....James Pleasant Parker 1892
ANALES DE OFTALMOLOGIA.....M. Uribe-Troncoso 1898
OPHTHALMOLOGY.....Harry V. Würdemann 1904
OPHTHALMIC YEAR BOOK AND LITERATURE.....Edward Jackson 1904-11

Annual Subscription Ten Dollars in Advance,
Single Copies One Dollar.

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY,
7 West Madison Street, Chicago, Illinois.

Entered as Second Class Matter January 1st, 1918, at the Post Office, Chicago, Ill., under the act of March 3rd, 1879.

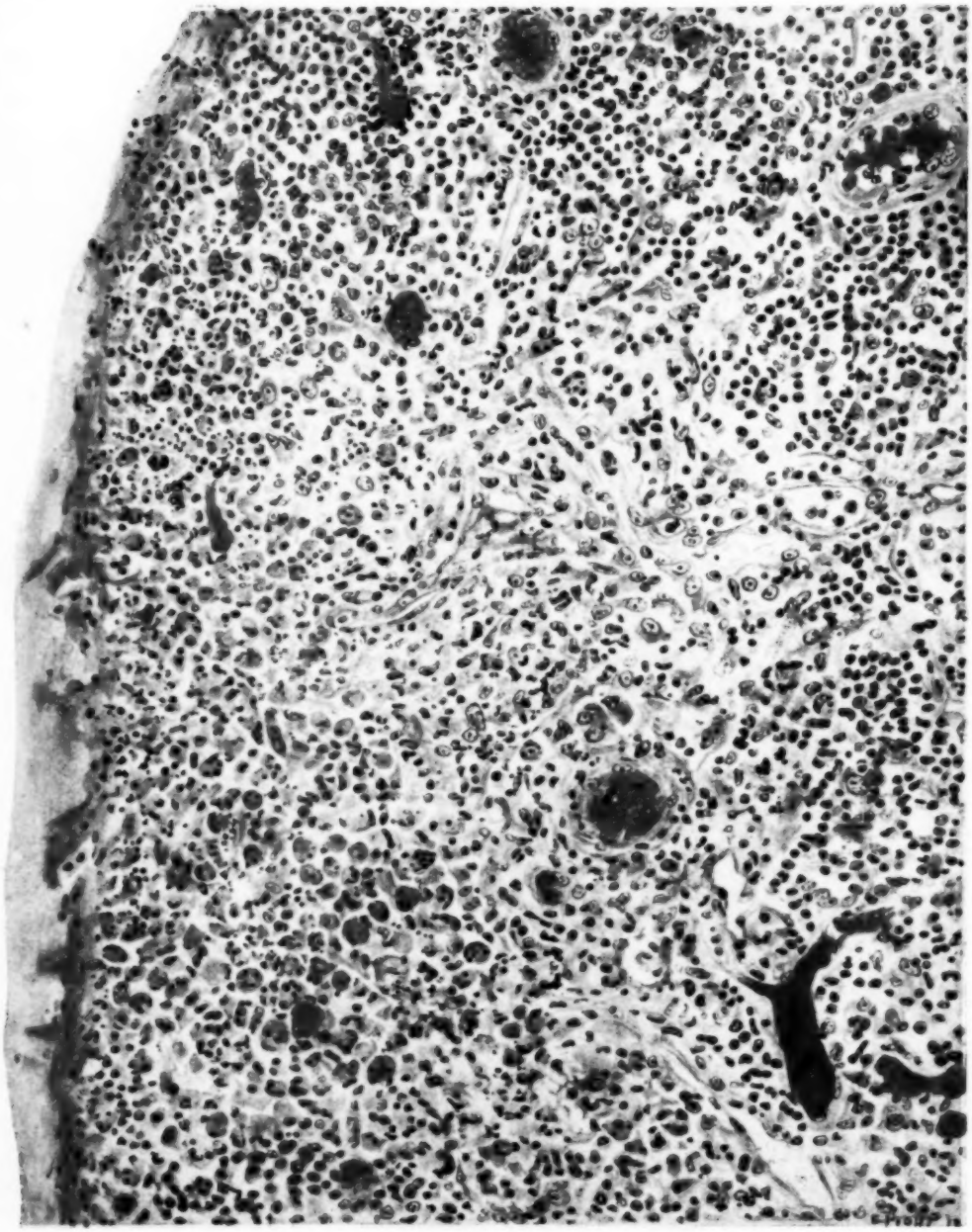

FIG. 1. CHARACTERISTIC LESION OF PARINAUD'S CONJUNCTIVITIS (LEPTOTHRICOSIS CONJUNCTIVAE) VERHOEFF. CENTRAL AREA OF CELL NECROSIS CONTAINS CHIEFLY ENDOTHELIAL PHAGOCYTES LOADED WITH CHROMATIN FRAGMENTS. MANY SHOW NUCLEAR PYCNOSIS, FRAGMENTATION AND OTHER EVIDENCES OF NECROSIS. GRANULATION TISSUE INVADING FROM RIGHT, AND AREA SURROUNDED BY CHRONIC INFLAMMATORY CELLS.

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OBSERVATIONS ON PARINAUD'S CONJUNCTIVITIS.

(Leptothricosis Conjunctivae.)

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(From the Massachusetts Charitable Eye and Ear Infirmary.)

An account of this disease based upon a study of eighteen cases verified by full microscopic examination; demonstrating the histologic characteristics of the lesion and the presence of the leptothrix. With colored plate and illustration in the text.

Five years ago I reported the finding of minute leptothrices in eleven cases of Parinaud's conjunctivitis and presented reasons for regarding these organisms as the cause of the disease[1]. Since other observers have failed to find these organisms, and many have continued to confuse the disease with tuberculosis of the conjunctiva, it seems worth while to record my further observations and to review my entire experience with the disease, which now covers a period of fourteen years.

Since my previous communication on the subject, I have seen and examined six additional cases of Parinaud's conjunctivitis in each of which the characteristic leptothrices were found in large numbers. In all, I have studied eighteen cases, a far greater number than has hitherto been reported by any other single observer, including Parinaud himself, who reported only four cases. This unusual experience has been due largely to the fact that colleagues, especially Drs. F. M. Spalding, F. E. Cheney, and P. S. Smyth, have referred their cases to me. All but one of the eighteen cases were seen by me clinically, and all of them were examined by me microscopically. In almost all of the cases I personally excised the tissues for examination. These cases were without question all authentic, whereas many of the cases in the literature are, to say the least, doubtful, so that the following analysis of the more important features of my cases probably gives a more accurate conception of the disease than would a similar analysis of the far larger series of cases that could be collected from the literature.

ANALYSIS OF EIGHTEEN CONSECUTIVE CASES OF PARINAUD'S CONJUNCTIVITIS.

(1) NATIONALITY.—All the patients were natives of the United States. Twelve patients had English names. In two cases the parents were born in Italy. There were no Hebrews.

(2) LOCALITY.—The patients lived in various towns within thirty miles of Boston.

(3) OCCUPATIONS. — The occupations of the patients or of their fathers were as follows: Laborer, 3; carpenter, 2; boilermaker, 1; machinist, 2; grocer, 1; stenographer, 2; factory hand, 1; electrician, 1; painter, 1; not recorded, 4.

(4) SEASON. — January, 6 cases; February, 1; May, 1; July, 1; September, 1; October, 1; November, 3; December, 4. The disease therefore occurred at all seasons, but was far more frequent in winter than in summer.

(5) TRAUMA. — Four cases gave definite histories of trauma within a week of the onset of eye symptoms. One patient was scratched in the eye by a grape vine, another by a cat, and another by his brother's finger. The other patient got twelve steel filings

into his eye which were picked out by means of a match.

(6) Animal Contact.—One patient took care of a horse, another a pig, one child played with a guinea pig. In no case was there contact with an animal known to be diseased.

(7) Age.—The youngest three patients were aged 3, 6, and 7 years; the oldest 35. The average age was 18 years.

(8) Sex.—Males, 14; females, 4.

(9) Eye Affected.—Right eye, 9; left eye, 9; both eyes, 0.

(10) Constitutional Symptoms.—These were insignificant in all cases. The highest temperature noted was 100 2/5°; but the temperature was taken in only a few cases and then not repeatedly.

(1) Glandular Involvement.—In addition to the preauricular, which was enlarged and tender in all cases, enlargement of the submaxillary glands was noted in 7 cases, and of the cervical glands in 3 cases. In no case did a gland break down, altho in several cases the swelling was very great. In one case the patient applied to a general hospital for treatment of the glandular involvement, before he was aware of the eye condition, but in the other cases the glandular involvement and the eye symptoms were noted at about the same time. In no case have I had opportunity to examine an affected gland histologically, but no doubt it would show the same lesions as the conjunctiva.

(12) Situation of Eye Lesions.—Above, 8 cases; below, 7; above and below, 2; bulbar conjunctiva, 3; palpebral conjunctiva, 4; fornix, 8; not accurately recorded, 3.

(13) Character of the Eye Lesions.—Polypoid projections of the conjunctiva of the fornix or lids were recorded in 7 cases. One was recorded as measuring 7 mm. in length and 2.5 mm. in thickness. They were usually single, but there were four small ones in one case. All of the cases showed from one to eight or more greyish or yellowish areas in the affected portions of the conjunctiva. The smallest of these were about ½ mm. in size, the largest three to four mm. The larger were not circular in shape, but generally roughly quadrilateral. In some cases it appeared as if the larger areas were conglomerations of smaller spots. They could be stained with fluorescein. In one case, in which the lower lid was chiefly affected, the upper lid showed one small grey area exactly on the lid margin. In three cases it was recorded that the fornix was thickened to such an extent as to overhang the cornea. In many of the cases there was marked enlargement of the ordinary conjunctival lymph follicles. Ulcers were not observed in any of the cases. The secretion from the eye was never abundant. The cornea was unaffected in all cases.

(14) Duration.—The duration of the eye symptoms before operation was from four days to five weeks; after operation, from five days to one month. The glands subsided more slowly, usually remaining somewhat enlarged for one to three months.

(15) Histology.—Every case in the entire series showed the histologic picture which I have shown to be characteristic of this conjunctival disease alone. The essential lesion is a focal area, .3 mm. in diameter or larger, densely packed with endothelial phagocytes loaded with broken down chromatin granules, which is situated just beneath the epithelium. These areas I have referred to as areas of cell necrosis. This term may have given rise to misconception, since it may have been understood to refer to areas of necrosis similar to those of tuberculosis, altho I have taken pains to explain to the contrary. Perhaps it would be better to term the lesions areas of endothelial phagocytosis. The explanation of these areas became obvious when I finally found within them leptothrices in large numbers. The endothelial phagocytes are evidently attracted by the leptothrices, since they invade the masses of the latter and since they frequently contain many of the organisms, a fact that I have previously neglected to mention. Many of the phagocytes show various stages of necrosis, due, evidently, to the toxic action of the or-

ganisms, the resulting cell detritus being taken up by the newly arrived phagocytes. This process is so extensive that it is difficult to find in the lesions an endothelial leucocyte which is free from chromatin fragments. The endothelial phagocytes seem to be derived chiefly from the endothelium of the conjunctival lymph spaces, for the cells of the latter can be seen in all stages of active proliferation while the spaces themselves are distended with the phagocytes. The endothelial cells never form Langhan's great cells in the areas of necrosis. In hundreds of sections of Parinaud's conjunctivitis examined, I have found only three Langhan's great cells, and each of these occurred away from the areas of cell necrosis. [See Plate XIV, Fig. 1.]

The tissue in all my cases was excised within a few weeks after the onset of the disease; and since recovery promptly followed, I have had no opportunity to study histologically cases that have persisted several months. The chief variations, I found, were in the sizes of the areas of the cell necrosis, and in the amount of granulation tissue that was formed as the result of the reaction around them. In the older cases there was a considerable number of pus cells in addition to the endothelial phagocytes in the lesions. Surrounding the areas, the tissue in all the cases was densely infiltrated with chronic inflammatory cells among which plasma cells largely predominated.

(16) Bacteriology. — Leptothrices in large numbers, were found in all cases except the one noted in my previous paper, in which there was insufficient material saved, and in no case were any other organisms found in the lesions. As regards the morphology of the organisms, I have nothing to add to my previous description, from which, for the sake of completeness, I quote as follows:

"In all cases the microorganisms occur in irregular masses measuring from 10 to 60 micra in diameters, but isolated individuals are also seen. At first the masses may appear to consist of minute dots, but careful examination with an oil immersion lens shows that they are composed of filaments. The latter seem to have no definite arrangement but are simply intertwined about each other. The individual filament is extremely delicate, stains

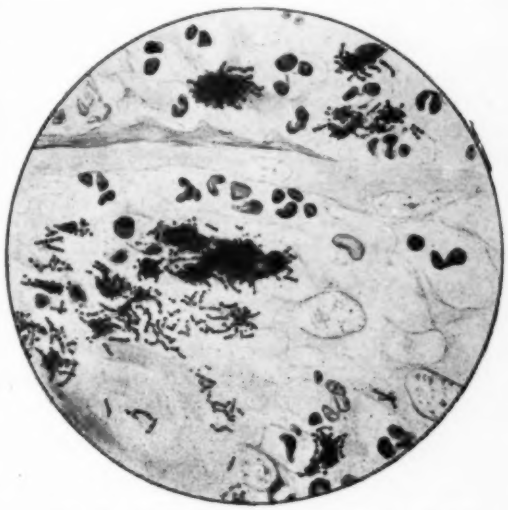

Fig. 2.—Showing masses of leptothrices and individual filaments in a large area of cell necrosis. Modified Gram stain. Zeiss comp. oc. 6, obj. 1-12.

faintly, and has single contour. It may be apparently straight or more often irregularly curved. Sometimes it is more than once bent almost at right angles. At almost regular intervals along the filament round dots occur which stain intensely by the modified Gram method. These dots are never exactly centered in the axis of the filament but project noticeably above its surface. The dots are seldom all of the same size on one filament, the largest having a diameter a little greater than that of the filament itself. Usually they are close together, at intervals of about three or four of their diameters, but occasionally they are far apart. In thickness the filaments are usually about .33 μ, that is, about the thickness of the influenza bacillus, but individuals half this size are occasionally seen, especially in tissue scrapings. In sections the filaments seldom appear very long, usually 3 to 10 micra, due no doubt to their quickly passing out

of the plane of the section. Some of the long filaments appear either to become thinner or to stain less intensely towards their ends." [See Fig. 2.]

"Except in one case the microorganisms are found only in or within the close vicinity of well marked areas of cell necrosis. In this case, which was evidently an early one, numerous masses can in addition be seen in the superficial lymph spaces, and are especially prominent just beneath the epithelium, where, as I have pointed out, the areas of cell necrosis usually occur. Such masses are undoubtedly the starting points for these areas, for all the stages in the formation of the latter can be made out, beginning with the invasion of a mass of microorganisms by a few endothelial cells. Thus this case is alone sufficient to exclude the possibility of the microorganisms being secondary invaders. The predilection of the microorganisms for the lymph spaces explains the early involvement of the regional lymph glands in this disease."

Method of Examining the Lesions.—The best method of demonstrating the microorganisms is by means of sections, but a special staining method is absolutely essential. In two cases in which I endeavored to demonstrate them in spreads made from the areas of phagocytosis I was successful, but the difficulty in staining the organisms was so great that I do not at present recommend this as a routine procedure.

In excising the tissue for examination, care should be taken to include one of the grey areas, for it is only in these that the organisms can be found. To insure good histologic specimens, care should also be taken not to grasp or in any way crush the portion of the tissue containing the area. The best fixative is Zenker's fluid, both for demonstrating the organisms and the histology of the lesions, altho in case of necessity it is possible to stain the organisms after other fixatives. Before placing the specimen in the fixing fluid, it should be placed upon and allowed to adhere to a small bit of paper in such position that later it can be oriented and sections cut vertical to the epithelial surface. For staining the organisms, I described in my previous paper a modified Gram stain, which was applicable only to paraffin sections. Since then, I have still further modified the method so that it may be used also for celloidin sections. While the results of the newer method are perhaps not superior to the best of those given by my original method, they seem to be more uniform. With this modification the preliminary treatment of the section with balsam is not absolutely necessary, but gives more brilliant results than when it is omitted. I have found this method superior to the Gram-Weigert method for demonstrating any sort of Gram positive organisms in sections.

1. Sections 6 μ to 10 μ thick. Stain lightly in hematoxylin and eosin, mount in Canada balsam, and examine under microscope. Select only sections which show areas of endothelial phagocytosis. After five minutes or longer (10 years is not too long) remove cover slip by aid of heat and wash off excess of balsam with xylol. Chloroform, 95 per cent. alcohol, water.
2. If celloidin section, place on slide, wipe off excess of water.
3. Stirling's gentian violet, 12 minutes.
4. Water. Remove from slide, if celloidin section.
5. Lugol's solution (1:2:100), 20 seconds.
6. Water.
7. Ninety-five per cent alcohol, in small dish, 20 seconds.
8. Chloroform, in small dish, 15 seconds.
9. Oil of origanum, in dish, 15 seconds.
10. Ninety-five per cent alcohol, 30 seconds. This removes the excess of stain from the celloidin.
11. Oil of origanum. Place on slide and blot.
12. Wash off thoroly with xylol and blot.
13. Xylol-balsam.

In the case of paraffin sections the same procedure is followed, except that

the solutions are dropped upon the slide.

The greatest care is required in the differentiation in alcohol and chloroform. A variation of a few seconds here makes a great difference in the results. It is therefore well to carry a number of sections at one time up to step (6) and then differentiate each separately, varying the time a few seconds from that stated. If the differentiation is perfect, the leptothrix filaments as well as the dots on them will be stained, otherwise the dots alone may be stained so that the organisms will appears as rows of dots. If the differentiation is carried too far, especially in the alcohol (7) the organisms may be completely decolorized.

Inoculations and Cultures.—Animal inoculations were made in six cases, with negative results in all instances. A guinea pig was inoculated subcutaneously in the groin in one case, and another in the anterior chamber. A rabbit was inoculated in the anterior chamber in one case, and beneath the conjunctiva in two cases. Pieces of tissue were introduced beneath the conjunctiva of monkeys (macacus rhesus) in two cases, and beneath the conjunctiva of a kitten in one case. A white mouse was inoculated in the abdominal wall in one case. An anthropoid ape, unfortunately, was never available.

Cultures were attempted in five cases. Coagulated blood serum, hydrocele agar, blood agar, glycerin agar, glucose agar, potato, under both aerobic and anaerobic conditions, were all used, but with negative results except for contamination with the usual bacteria. Owing to the organisms being so near the surface of the tissue it is of course difficult to avoid contaminations with the surface flora. Another difficulty in making cultural examinations, is that the cases are so infrequent that it is not possible to have special culture media ready when they occur. For this reason I have not had opportunity to employ the media used by Noguchi for cultivating the spirocheta pallida.

From the foregoing it will be seen that in Parinaud's conjunctivitis we have a disease that presents focal lesions differing in character from those of any other conditions of the conjunctiva, that within these foci and nowhere else, there invariably occur minute leptothrices, differing from any other known organisms, that no organisms of any other kind can be demonstrated in these foci, that the lesions are covered with epithelium which protects them from contamination with surface microorganisms, that endothelial phagocytes are attracted by the leptothrices, taken up by them, and are thereby destroyed, thus explaining the character of the lesion, and, finally, that all these conditions occur in every case. From these facts the conclusion is inevitable that the leptothrices are the cause of the disease. It would, of course, be desirable, if possible, to cultivate the organisms, and to reproduce the disease in animals, but this additional evidence is certainly unnecessary here, and while artificial cultivation of the organisms will no doubt finally be accomplished, it is doubtful if reproduction of the disease in animals other than man will ever be successful. [Since this was written, Wherry and Ray[2] have reported the cultivation of a leptothrix from the preauricular gland in a case of Parinaud's conjunctivitis. They employed Dorset's egg medium incubated under partial tension and anaerobic conditions. They state: "It seems probable tho not certain that the organism grown by us is identical with that found in sections by Verhoeff."]

Confusion with Tuberculosis.—Owing to the frequency with which cases of conjunctival tuberculosis have been described as cases of Parinaud's conjunctivitis, some observers have maintained that the latter is not in fact an entity. The above observations, however, prove conclusively that there is a disease of the conjunctiva, due to infection with a specific microorganism, and presenting histologically characteristic lesions, that possesses the clinical features described by Parinaud. Since these clinical features are in

themselves so characteristic as to exclude, except possibly in isolated instances, all other diseases of the conjunctiva, there should be no doubt that the disease investigated by me is identical with that described by Parinaud. Parinaud, however, knew nothing of its histology or etiology, so that to this extent his identification of the disease was incomplete. For this reason it would be preferable now to employ the designation *Leptothricosis Conjunctivae*.

Altho it has now been fourteen years since I described the characteristic histologic picture of Parinaud's conjunctivitis, and many observers have subsequently made microscopic examinations of the tissues in the disease, yet only one observer, Bernheimer,[3] has given a sufficiently accurate description to show that he has recognized the essential lesions. The descriptions of other observers seem to indicate that they have given their attention to the diffuse infiltration around the essential lesions, which presents no especially characteristic features. In some instances no doubt the lesions have simply been overlooked, in others insufficient sections have been made, or care has not been taken to see that the tissue removed contained one of the greyish areas referred to above. In this connection, it may be well to point out, that enlarged lymph follicles which are often present in this disease, should not be mistaken for the essential lesions. Since most of the observers have thus failed to find the essential lesion of the disease, it is not surprising that they also failed to find the infecting organisms which occur only in these lesions.

The evidence of those observers who maintain that Parinaud's conjunctivitis is a form of tuberculosis seems to be about as follows in all cases: A patient presents himself with one or more granulations springing from the conjunctiva and an enlarged preauricular gland. The condition being a novelty to the observer, he makes a diagnosis of Parinaud's conjunctivitis. He then removes some of the tissue and inoculates with it a guinea pig or rabbit. The animal develops tuberculosis, hence Parinaud's conjunctivitis is a form of tuberculosis! As a matter of fact all that he has proved is that his original diagnosis was erroneous. If he had made a microscopic examination of the tissue he would have found the typical histologic picture of tuberculosis, which as I have conclusively shown does not bear the slightest resemblance to that of Parinaud's conjunctivitis. These observers seem to ignore the fact that guinea pigs have frequently been inoculated with tissue from cases of Parinaud's conjunctivitis, with negative results.

In the clinical differentiation of Parinaud's conjunctivitis from conjunctival tuberculosis there are three facts to be taken into account, the importance of which seems to have been generally overlooked, namely, that the onset of Parinaud's conjunctivitis is relatively acute, that the glandular involvement is practically synchronous with the onset of the eye symptoms, and that the affected conjunctiva always shows one or more greyish areas, the essential lesions of the disease. These facts, it seems to me if positively established in any case are alone sufficient to exclude tuberculosis. As regards the relative frequency of these two conditions this would of course be expected to vary in different regions, but as concerns Boston and its vicinity some idea of it may be inferred from the fact that I have examined only five cases of conjunctival tuberculosis within the period within which I examined the eighteen cases of Parinaud's conjunctivitis.

COMMENTS.

According to my observations, both clinical and histologic, the terms granulations, polypoid vegetations, ulcers, and erosions, are not strictly applicable to any of the lesions of Parinaud's conjunctivitis. I have never seen actual loss of substance occur so that no doubt the terms erosions, and ulcers, described in the literature usually refer to the greyish areas of endothelial phagocytosis, which are still covered by epithelium. It seems possible, however, that in more advanced cases loss of substance might occur.

The so called granulations and polypoid vegetations do not usually arise, as these terms would suggest, from an exuberant growth of granulation tissue thru breaks in the surface of the conjunctiva, but are due to the extreme infiltration about the essential lesions, and an interstitial formation of granulation tissue, which together cause the affected conjunctiva to project more or less abruptly above the surrounding surface. For this reason they never occur on the bulbar conjunctiva but almost exclusively on the retrotarsal folds where the subepithelial tissue is most abundant.

As regards the source of the infection, my cases seem to throw no light of a positive nature. It is clear, however, that the infection is not transmitted from man to man since cases of the disease occur at long intervals; and no instance is known of an individual affected with the disease having been associated in any way with another individual similarly affected. My cases also do not lend support to the theory of animal origin, for while in four cases there was close contact with some animal, it was a different kind of animal in each case, and there was no case in which there was contact with an animal known to be diseased in any way. Moreover, inoculations of various animals all gave negative results. It is conceivable, however, that the organisms may exist as saprophytes on animals.

The fact that the incidence of the disease was greatest by far in the winter must be of great significance; but just what the meaning of this may be it is impossible at present to say. This is probably true also of the fact that males were much more frequently affected than females. The great rarity of the disease does not necessarily indicate that the leptothrices are not abundant in Nature; but may mean that only exceptional individuals are susceptible; and that slight injury to the conjunctiva is required to give the organisms entrance to the tissues. That the affected individuals have a certain degree of immunity to the disease is shown by the fact that it never becomes generalized and recovery always takes place in a relatively short time. Incidentally, this high natural immunity on the part of man suggests that animals also may be immune, and that transference of the disease to animals may never be accomplished.

The histories of slight but definite abrasive injuries to the conjunctiva obtained in four of my cases suggest nothing in regard to the source of the infection, but are of great importance in showing the incubation period of the disease. In two cases, the eye symptoms began three days after the injury, in one case one week, and in the other case, two weeks. The latter case was that of a child three years of age who had been scratched in the eye by a cat, and since the condition was well marked when first noticed by the father, it is probable that symptoms had been present for at least a week. These cases would seem to set the incubation period at three days to one week.

The fact that the disease is rarely, if ever bilateral, may possibly be explained on the assumption that for infection to occur slight injury to the conjunctiva is essential, or more probably by the fact that the organisms, so far as I can determine, occur exclusively in the areas of endothelial phagocytosis beneath the intact epithelium, and hence do not get into the conjunctival secretion. In either or both of these ways also may be explained the fact that the disease is never transmitted from one individual to another, altho here again the question of natural immunity may enter.

It is noteworthy that all of my cases were unilateral and that in none of them was the cornea affected. In the literature, however, there are a few cases recorded in which both eyes were affected and a few also in which the cornea was involved. Such unusual cases, it seems to me, should not be accepted as authentic unless they are shown to possess the characteristic histologic changes described by me, and leptothrices are demonstrated in the lesions. Most of the cases in the literature are single cases reported by ob-

servers who have had no previous experience with the disease and who are therefore not in position to make an accurate clinical diagnosis. It would, therefore, seem best, in fact, to accept no diagnosis of the disease based on clinical findings alone.

DESCRIPTION.

In conclusion, it seems to me, I can best summarize my observations on Parinaud's conjunctivitis by giving the following brief description in which I have attempted to correlate the clinical, histologic, and bacteriologic features of the disease:

Parinaud's conjunctivitis, or leptothricosis conjunctivae, is a subacute inflammatory condition of the conjunctiva due to infection with a minute leptothrix, and is always associated with inflammatory enlargement of the preauricular or other regional lymph glands. The source of the infection is unknown. In some cases there is a history of slight trauma to the conjunctiva preceding the infection. The incubation period is from three to seven days. The glandular enlargement is synchronous with the onset of the ocular symptoms. The essential conjunctival lesions consist of focal areas situated immediately beneath the epithelium, infiltrated with endothelial phagocytes in various stages of necrosis. Clinically these foci appear as opaque greyish areas from about ½ mm. to 4 mm. in diameter. In individual cases they may be single or multiple, and may occur in any part of the conjunctiva including the bulbar portion. They contain the leptothrices in great numbers. Beneath these areas more or less granulation tissue is produced which may cause the conjunctiva to project in the form of polypoid nodules. The latter occur chiefly on the fornices. Ulceration seldom if ever occurs. In the affected regions, the conjunctival tissue is congested, edematous, and densely infiltrated with chronic inflammatory cells, among which plasma cells largely predominate. In marked cases this causes the fornix to become everted and to project like a curtain over the cornea. Frequently the normal conjunctival lymph follicles are greatly enlarged. The congestion and edema extend through the whole of the lids so that in severe cases ptosis may result. The conjunctival secretion is slight in amount and mucopurulent in character. The cornea is unaffected. The local subjective symptoms are not severe, and constitutional symptoms are slight or entirely wanting. The affected glands seldom break down.

The disease is almost if not always unilateral, attacks almost exclusively children and young adults, and males more frequently than females. It is most prevalent in winter, and, so far as known, is never transmitted from one individual to another. The most efficient treatment is excision of the grey areas and nodules. The duration of the eye symptoms after this treatment is from one to five weeks. The glandular enlargement may persist for a considerably longer period.

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EXPLANATION OF PLATE.

Plate XIV.—Showing characteristic lesion of Parinaud's conjunctivitis. The entire lesion, which is unusually small, is included in the field. The central area beneath the epithelium—area of cell necrosis—contains chiefly endothelial phagocytes, loaded with chromatin fragments. Many of the phagocytes show nuclear pycnosis or fragmentation and other evidences of necrosis. The area is being invaded by granulation tissue from below, and is surrounded by chronic inflammatory cells which here consist almost exclusively of lymphocytes. Just beyond the limits of the illustration plasma cells greatly predominated. Other sections of this lesion, specially stained for the purpose, showed it to contain relatively few leptothrices, owing evidently to its small size. Zenker's fixation. Celloidin section. Hematoxlyin and eosin. Zeiss oc. 18, obj. AA.

TRANSIENT RELAPSING ENOPHTHALMOS OF SYMPATHETIC ORIGIN.

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The case here reported differs materially from the conditions of enophthalmos described in the text-books in the striking features of the attacks and the association of enophthalmos with pregnancy. Translated from the Spanish by M. Uribe-Troncoso, M. D.

The opportunity has been offered to me for observing a very interesting case of transient enophthalmos, with some unusual features, making it worth recording.

Mrs. C., 25 years old, from Aguascalientes, Mexico, well built and strong, has always been in good health. No history of neuropathic disease could be elicited. She was married a year ago and almost immediately showed signs of pregnancy. On the third or fourth month, without any apparent cause, when dressing her hair before a mirror, she felt suddenly that her left eye sank in the orbit, a fact that she could immediately verify at the mirror; the eye appearing smaller and sunken and the palpebral fissure narrower. Moreover, the skin on both lids became entirely white and bloodless. She was very much frightened, and went to her husband and other persons in the family, who were able to verify these symptoms. A sensation of torpidity and difficulty of moving the lids and the eyeball were present.

After fifteen minutes of this paroxysm the skin of the lids became colored, the palpebral aperture widened and the eye came forward. The patient thought all was over, but two or three weeks afterwards the condition returned and then reappeared several times at irregular intervals.

The family physician sent the patient to me. I had the good fortune of witnessing one of the seizures. The syndrome began with marked paleness of the left side of the face, specially noticeable in the lids and conjunctiva, which were completely bloodless. A few minutes later the patient had the sensation of sinking of the eyeball; and an examination revealed a narrowing of the palpebral fissure, ptosis of 20°, measured with the perimeter, and a recession of the eyeball in the orbit of about five millimeters.

The pupil was smaller than that of the other eye. The patient was able to lift the upper lid only to a very limited degree. The brow on the side of the ptosis was not drawn up, and there were no wrinkles on the forehead, as is the case when there is a palsy of the levator. On the contrary, the brow was lower and the wrinkles were formed on the lids themselves, as in the pseudo-paralytic ptosis of hysteria, which is due to a contraction of the orbicularis.

The movements of the eyeball were difficult and delayed, but the excursions were normal. The fundus showed no signs of abnormality. Intraocular tension was diminished.

After fifteen or twenty minutes the skin of the lids recovered its color, the palpebral aperture widened, the eyeball advanced in the orbit and the whole paroxysm ended, only leaving the patient much frightened and greatly depressed. A careful examination made afterwards failed to detect any abnormality in the eyes. Refraction was normal; the mobility of the pupil and eyeball normal. Vision = 1, in both eyes. Visual fields and color vision normal; as were also the conjunctival and corneal reflexes.

The diagnosis in this case is not difficult; we are dealing with a transient, relapsing enophthalmos, attended with ptosis, myosis, hypotension and spasm of the cutaneous and mucous vessels, due to a nervous disturbance; the motor, sensitive and angiospastic symptoms being characteristic. But to what part of the nervous system must they

be ascribed? What is the anatomic diagnosis?

There are paradoxic symptoms which are difficult to interpret if we are going to be guided only by the physiologic experimentation. In fact, the intense paleness of the lids and conjunctiva on the left side alone, the narrowing of the palpebral aperture, the diminished intraocular tension, the enophthalmos and myosis, are all symptoms of a disturbed condition of the sympathetic nerve on one side.

According to physiologic investigations, paralysis of the sympathetic produces:

(a) Retraction of the eyeball due to paralysis of the smooth muscular fibres of Tenon's capsule.

(b) Narrowing of the palpebral aperture due to paralysis of the smooth muscles of the lids, which cannot balance the stronger and opposing action of the orbicularis.

(c) Myosis, which may be due either to a paralysis of the dilatator iridis or, as others point out, to the suppression of the inhibitory action of the sympathetic upon the sphincter of the iris.

(d) Diminished intraocular tension.

(e) Dilatation of the blood vessels, showing itself by redness of the skin, of the conjunctiva, ear, auricle, etc.

However, in my patient, instead of the last symptom there was the opposite condition: a marked angiospasm of the skin and the conjunctiva, undoubtedly due to a stimulation of the sympathetic. How can we explain these contradictory symptoms? In the first place, the physiology of the sympathetic is still surrounded by darkness, and the pathologic physiology sometimes produces true dissections; that is to say, separates the functions of one organ in different ways. It is a well known fact that the cervical sympathetic gives to the vessels, not only vasoconstrictive fibres but also vasodilator; whose antagonistic effect maintains the vascular balance. If we suppose that the paralysis was confined only to the vasodilators, leaving intact the action of the opposite fibres, then the predominant action of the former will produce the paleness of the skin and conjunctiva; symptoms not really of stimulation, but only of lack of the opposite action or tonus.

In regard to the cause of this transient paralysis of the sympathetic, it is necessary to suppose in the absence of any other cause that it was due to pregnancy. The influence of pregnancy upon some trophic disturbances, which are due to the sympathetic, is now well admitted, i. e., the so called cutaneous syndrome, pigmentation around the nipples, the pigmentary line on the abdomen, pigmentation of the face, etc. We are probably not far away from the real fact in considering this relapsing sympathetic paralysis as due to pregnancy.

What is more difficult to ascertain is, if it is due to a purely reflex action; or to the toxins arising from pregnancy and circulating through the system. In favor of a reflex action is the rapidity of the outbreak and its transient character. But an influence of the autotoxins upon the ganglion cells of the sympathetic cannot be excluded. An elective action may be produced just the same as strychnin has a selective convulsive action, morphin an analgesic effect and curare only acts upon the motor terminations of the nerves.

GLIOMA OF RETINA, WITH REPORT OF THREE CASES TREATED WITH RADIUM.

REX DUNCAN, M. D.

LOS ANGELES, CALIFORNIA.

The cases here reported seem to indicate that radium exposures will cure at least some cases of glioma. This paper was read before the Eye, Ear, Nose and Throat Section of the Los Angeles County Medical Society, March 1918. With four illustrations.

Glioma is the only neoplasm occurring primarily in the retina, according to Fuchs, and is essentially malignant. It is found usually in children under four years of age. Curt Adam (1) reports that from the records of 47 cases studied, 94 per cent were under four years of age, and all were less than 12 years old.

Cases have been reported in which the condition was present at birth. While heredity as an etiologic factor seems improbable, O'Connor (2) quotes a number of reports in which several children of the same family were afflicted.

Glioma retinae is usually unilateral, altho both eyes are involved in 15 to 20 per cent of the cases reported. The clinical course of glioma has been so well described by von Graefe (3) and others, that a repetition here seems superfluous. However, I wish to refer briefly to the progress of this disease. In the first stage, the disease manifests itself by blindness and a peculiar yellowish reflex emanating from the pupil, which has caused the condition to be known as "Amaurotic Cat's Eye." Inflammatory symptoms are absent. In the second or glaucomatous stage, there is increased tension and the eye becomes irritated and painful, altho occasionally the eye shrinks and temporarily assumes the characteristics of phthisis bulbi. In the third stage, the tumor grows out from the eye and involves the orbit, or extends along the optic nerve to the brain. Ultimately, the eye is transformed into a large, bulging, ulcerated, bleeding mass, filling the orbit and projecting out thru the lids. In the fourth stage, there occurs metastasis into the adjacent tissues and lymphatic glands. Usually the bones of the skull and face are involved, and later the other organs and viscera. Death results from exhaustion or the involvement of the brain or other vital organs.

In considering the diagnosis, and results of treatment, in these cases, great care must be taken to exclude pseudoglioma and only those cases should be considered in which a definite microscopic diagnosis has been made. A report from Moorfield's Hospital for 1888 to 1893 indicated that 7 of 24 eyes enucleated for glioma were found to be pseudo growths. Krauss (4) states that Treacher Collins found in 7 cases out of 24 eyes enucleated for glioma that the diagnosis was incorrect; Vesch and Isler, 4 times in 41 cases; Haab, 5 times in 20 cases; and, Greef, 4 times in 21 cases. No doubt, errors of diagnosis are quite as common in private practice, and cases have been reported as cured which were in fact cases of a benign pseudo growth.

Early diagnosis and prompt treatment are the important factors in these cases. Fuchs, quoting Leber, states that enucleation in early cases, when the neoplasm is confined within the eyeball, results in almost 40 to 50 per cent cures. Extension into the optic nerve beyond the point of excision, or perforation of the eyeball and involvement of adjacent tissues, or metastasis or recurrence after enucleation renders the prognosis, surgically, practically hopeless. The following review of individual cases reported in recent literature, would suggest that this condition is not diagnosed early and shows a high mortality.

Stieren (5) reports the following three cases: Male, 2 years 5 months of age, bilateral glioma. Died un-

treated 2 months after diagnosis. Female, 3 years 4 months, with unilateral glioma. Immediate enucleation, followed by death in 3 months from cerebral involvement. Female, 7 years, unilateral glioma, tumor involving nerve-head, and confined within eyeball. Enucleation and patient apparently well 18 months later.

Reeder (6) reports: Male, 7 years. Glioma retina, bilateral, with extension without to orbital tissues. Bilateral enucleation and death soon after from sepsis and general metastasis.

Stieren (7) reports: Male, 16 months. Unilateral glioma retina involving all the structures of the eyeball and orbit, with metastasis in antrum and buccal mucous membrane, resulting in death from asphyxiation 10 weeks later.

Hoster (8) reports: Male, 22 months. Unilateral glioma retina, with enucleation, followed by recurrence.

O'Connor (9) reports: Female, 9 months. Glioma of retina and atrophy of bulb with metastasis into superior maxilla. Eye was enucleated but death followed in 2 months.

Obviously, the prevention of recurrence after early enucleation, and the treatment of late and recurrent cases, which comprise a high percentage of the total, are of the utmost importance. A somewhat detailed report of the following three cases is, therefore, of interest:

Case No. 1, referred to me by Dr. Frank Miller, whose report is as follows:

"J. R. W. Age, 6 years, male. Patient had never noticed any disturbance of vision or abnormal condition until forty-eight hours previous to my seeing him, when patient's mother noticed that eye was quite reddened and he complained of considerable pain. This condition increased until the pain was intolerable.

On examination, found eye with a very marked increased tension; intense ciliary injection; cornea clear; pupil dilated and fixed. Immediately behind the lens there presented a tumor mass.

A diagnosis of intraocular malignancy was made.

Immediate enucleation advised and performed. Nerve resected in the apex of the orbit. On sectioning the eye, (see Fig. No. 1) large intraocular glioma together with involvement of the optic nerve at point of resection.

Fig. 1.—Case 1. Cross section of the eye showing glioma. Microscopic section showed nerve-head involved at the point of resection.

The case was immediately referred to Dr. Duncan for radium treatment. At this date, 18 months after operation and radium treatment, there has been no evidence of recurrence."

Enucleation was performed August 10, 1916, and radium treatment begun August 18th. Three applications of radium were made, employing 50 to 125 mgrms., screened with 0.5 mm. of platinum and 1.3 mm. of brass, covered with gauze and rubber. The applicator was placed, and retained, well back into the orbital cavity and the tissues anterior protected. There began about 6 days after treatment, a slight inflammatory reaction of the orbital tissues, which subsided after about 2 weeks. As previously stated, there is no evidence of recurrence after more than 18 months.

Case No. 2, referred by Dr. Ross A. Harris. Dr. Frank Miller, who first saw the case at the Children's Hospital, reports the condition at that time as follows:

"Anna M., age 2½ years, female. Patient first seen August, 1916. Tumor

mass discovered in vitreous. Pupil dilated and fixed. Considerable exudate in anterior chamber. Cornea clear.

Advised immediate enucleation which was refused. Patient did not return for nine months at which time the eye was painful and quite hard. There were several bulging areas on the anterior part of the sclera thru which choroidal pigment showed quite clearly.

Immediate enucleation was performed with resection of the nerve as far back as possible. On section, the eye was filled with glioma, (see Fig. No. 2) and microscopic section showed the nerve tissue was involved also.

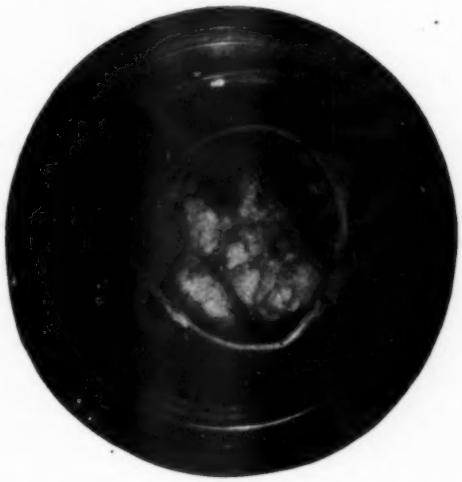

Fig. 2.—Case 2. Cross section of the eye showing glioma. Microscopic section showed nerve involved at point of resection.

Instructions were given to return the child every week for observation, but she has not been seen by me since."

This case was seen by Dr. Ross A. Harris in October, 1917, and immediately referred to me for radium treatment. There was present extensive involvement of the orbit with a tumor about 4 cm. long, extending 2 cm. below the orbit. The lymph nodes over the left parotid enlarged and palpable. Child anemic and poorly nourished. Radium treatment was begun October 24th. A 50 mgrm. tube of radium, screened with platinum, was placed thru a puncture incision into the infra-orbital tumor and 60 mgrm., screened with platinum and brass, placed in the orbital cavity. Several treatments were given, which resulted in a rapid absorption and disappearance of the orbital involvement in about three weeks. The glands were treated at the same time and disappeared. The patient did not report for observation, as instructed, until about one week ago, at which time I found some slight enlargement in the superficial cervical glands. This is improving under treatment and the prognosis is hopeful, if the patient will stay under treatment and observation, which is, however, doubtful.

Case No. 3, referred by Dr. W. H. Roberts, whose report is as follows: "P. R. C., Jr., was brought to our office, September 16th, 1916, when he was twenty-seven months old. The parents stated that for a year or more they noticed that the right eye turned out at times. There was no evidence of pain.

Examination showed a golden-yellowish reflex in the pupillary area, the typical "Amaurotic Cat's Eye." The pupil was dilated and inactive. The eyeball was not congested. There was no increase in tension. The vitreous chamber was filled with a whitish growth. The retina appeared to be detached and crowded forward by this growth. Nothing was found in the left eye.

A diagnosis of glioma of the retina was made and concurred with by Drs. Macleish and Mansur. Immediate enucleation was advised. This was done on September 22nd, 1916. A portion of the optic nerve, external to the globe, was removed and sectioned at once, and under the microscope shown to be free from any malignant growths.

The eyeball was sent to Dr. E. B. Burchell, at the New York Eye & Ear Infirmary, who made a gelatin mount of one-half (see Fig. No. 3), and he prepared sections from the other. His pathologic report is as follows: "The growth is that of glioma; it involves the whole retina, right to the lamina

cribrosa, but does not pass thru the iris, which is adherent to the posterior layer on the cornea, showing that the eye is in a glaucomatous stage. The large vessels of the choroid appear to be infiltrated with the tumor cells."

Fig. 3.—Case 3. Cross section of the eye showing glioma. Microscopic section showed nerve not involved at point of resection.

Following the operation, the child made a speedy recovery, and showed no evidence of any return of the tumor, until the 24th of April, 1917, when he was brought into the office because two days before a slight discoloration was noticed in the orbit.

Examination showed, a little to the nasal side of the central part of the orbit, a slight bluish discoloration, and with the finger, a mass could be felt. Nothing could be seen in the other eye.

Following this, X-ray treatments were used, but the growth slowly enlarged.

On the 19th of May, he was referred to Dr. Rex Duncan for radium treatment, and by the 8th of June, the tumor in the orbit had entirely disappeared.

May 24th to 29th, the patient received three treatments employing 50 to 110 mgrms. of radium element. As stated, there occurred a rapid absorption of the tumor. There resulted a slight inflammatory reaction which completely subsided in about three weeks. The cosmetic result is perfect, except for the loss of the eyelashes. (See Fig. No. 4.)

While the three cases above reported are too few to justify definite conclusions, in view of the frequency of recurrence and high mortality following surgical treatment alone, the results obtained in these, and similar cases, would seem to warrant the following conclusions:

In early cases, immediate enucleation, followed by immediate prophylactic radium radiation, would prevent a high percentage of recurrences;

In later cases, in which the nerve stump or orbital tissues are also involved, immediate enucleation, followed by proper radium treatment, should be employed;

In recurrent cases, radium therapy is a most effective method of treatment.

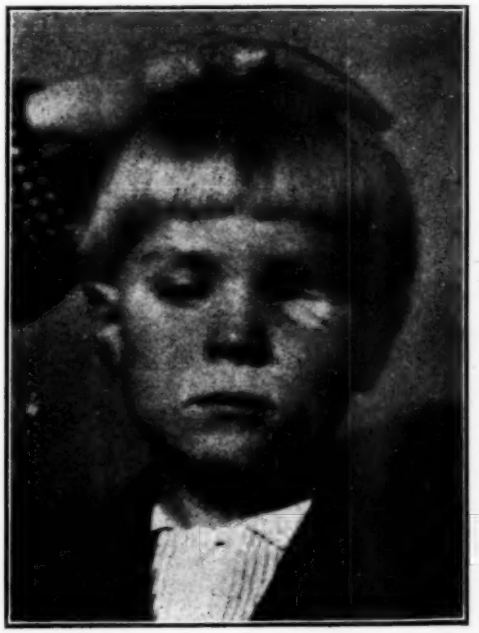

Fig. 4.—Case 3. Glioma Retinae Recurrens gradually increased under X-ray treatment. Responded promptly to radium and apparently well more than fifteen months after treatment.

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PLASMOMA OF THE CONJUNCTIVA (PASCHEFF).

KAZUO HIWATARI, M. D.

KYOTO, JAPAN.

This is a report of three cases with histologic examination of the involved tissue seeming to show that plasmoma of the conjunctiva should not be regarded as a new growth. Translated from the German by H. Aufmwasser, M. D. With two illustrations.

Since the first publication of Pascheff, about plasmoma of the conjunctiva, numerous cases have been reported as belonging under this heading from different countries — Bulgaria, Hungary, Prussia, Russia and Japan.

Clinically this tumor appears at times as a diffused, again as a circumscribed thickening of the conjunctiva or the cornea. Processes of irritation are rarely observed in these cases. Youthful individuals below thirty years of age mostly are affected. About half of the cases (11 in 22) show trachomatous changes, as pannus of the cornea, trachoma, follicles, etc.

Histologically this tumor is characterized by a special abundance of plasma cells. The question of the pathogenesis of this tumor is until now not fully clear. A number of authors (Rund, Deutschmann, etc.) look upon it as a true neoplasm of the conjunctiva; whilst others (Pascheff, Rados, Sawada, Shikano, Fudiwara,) look upon it as a kind of inflammatory granuloma, which has a close relationship to trachoma.

It may not be without interest to relate the following three histologically examined cases, belonging under the heading:

CASE 1.—Woman, age 26 years; farmer. History: Since ten years old the patient is supposed to have had trachoma; and since the last two years she noticed a gradual swelling of both lower lids. The excised piece of conjunctiva taken from the right lower lid, with the tarsus, was sent to me by one of my colleagues for histologic examination.

Histology: The conjunctiva showed distinctly a papillary overgrowth. The subepithelial tissue is diffusedly permeated with typical plasma cells, other kind of cells are found sparingly only. Very prominent is the frequent appearance of Russel's bodies. Between the epithelium and this infiltration of plasma cells, there is imbedded in places a stratum of connective tissue of different thicknesses; which we look upon as scar tissue. This infiltration with plasma cells is of varied thickness, in one place of such a degree that it appears to be a real tumor. The epithelial layer above, which everywhere shows papillary hypertrophy, was more or less distinctly flattened by pressure. At another place where the plasma cellular infiltration was only sparely developed, the histologic picture is very similar to that of trachoma. Towards the lower portion, the fibrous connective tissue gradually increases at the expense of the plasma cells; so that between the conjunctiva and the tarsus a layer of dense connective tissue is interposed. The latter here and there shows powerful development and hyaline degeneration. In the tarsus

we see again a plasmacellular infiltration. The Meibomian glands mostly are atrophied.

CASE 2.—Servant girl 18 years old. The general examination except some glandular swellings, is negative. Examination of blood is negative. For years she complained of slight secretion of both eyes, and of ptosis of the left upper lid. In everting the lid, the conjunctiva was found visibly thickened, especially in some places to miliary nodules and to nodules of the size of a small pea. Slight scar formation in some places can be demonstrated. The lower conjunctiva is only slightly hyperemic. On the right eye no tumor formation can be demonstrated; but in the upper conjunctiva we have a trachomatous thickening of the conjunctiva.

Histology. A nodule from the formix is taken and examined. This nodule consists almost exclusively of typical plasma cells in dense formation, and polynuclear leucocytes sparingly dispersed. In the center of the nodular accumulation of plasma cells lies a small elevation of tightly compressed lymphocytes, which toward the periphery, without sharp demarcation, intermingle with the surrounding plasma cells. Fig. 1. a. Russell's bodies are also present in large numbers. Between the epithelium and the tumor there is a stratum of dense connective tissue, which sends a few fine branches deeply between the plasma cells.

What appeared remarkable in this case, is the presence of a fairly strong plasmacellular infiltration, in that part of the conjunctiva bulbi immediately adjoining the tumor; which was extirpated along with the rest and clinically looked absolutely intact. Fig. 1. b.

CASE 3.—A working woman age 20 years, with tonsillar hypertrophy and swelling of the lymphatics of the neck and paleness of the external skin. On the right eye of this woman a severe ptosis was noticed, she could not open the eye spontaneously. On everting the upper lid, which could be done only with great difficulty on account of its rigidity, the tarsal conjunctiva and fornix showed a diffuse, hard thickening of pale color. The thickness was of such high degree that the piece of conjunctiva excised for histologic examination measured in thickness about 4 mm. The conjunctiva of the lower lid and the transition fold are diffusely scarred, on the cornea above pannus-like changes. The conjunctiva of the left eye showed also old trachomatous changes.

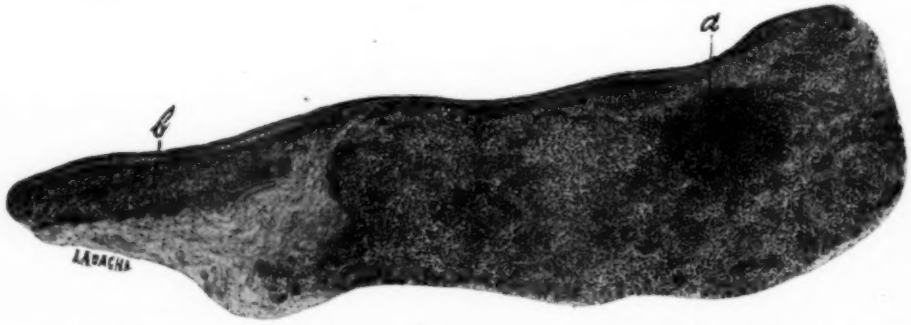

Fig. 1.—Plasmoma of Conjunctiva (Hiwatari) Second case. Showing Russell's bodies and connective tissue between epithelium and tumor.

Histology: The thickening of the conjunctiva presents here also massive accumulation of typical plasma cells, the other migratory cells are sparingly formed. Russell's bodies were not present. Deeply, the infiltration, as in the first case, becomes slighter; and in its place a fibrous connective tissue, poor in cells, is found. Immediately beneath the epithelium, which is more or less flattened, is a thin sheath of scar tissue. A few connective tissue bands, which running obliquely or horizontally, combined the latter with the

above mentioned deeper lying scar, divide the plasma cellular infiltration in different parts. Fig. 2.

As it can be seen from each description, there is no doubt, that my cases here presented are plasmoma of the conjunctiva. The histologic findings in general are equivalent with those heretofore described.

What I wish to accentuate as specially important, is: (1) the presence of a distinct scar formation in all cases, (2) the appearance of plasmacellular infiltration in the conjunctiva adjacent to the tumor, which clinically showed nothing pathologic (Cases 2 and 3) the existence of clearly visible trachomatous changes on the second eye.

Fig. 2.—Plasmoma of Conjunctiva (Hiwatari). Third case. Showing accumulation of plasma cells infiltration and fibrous connective tissue.

Rund and Deutschmann have regarded plasmoma of the conjunctiva as a genuine tumor. My above observations are entirely against this conception, without needing an especial explanation. The opinion of Rados, that polynuclear leucocytes in small numbers always are found in the tumor or tissue, is not in accord with this conception. Regarding the appearance of scar tissue in the plasmoma, I find these described in the literature only in one case of Rados, whilst I have found the same in all of my three cases. It might be important later on to take notice of those findings. Therefore today, without doubt, we have to look upon the plasmoma as a kind of inflammatory granuloma. The fact that plasmoma cases up to now have been reported from trachoma countries only, is in favor of this conception. The plasmoma probably etiologically is identical with trachoma, and can be distinguished from genuine trachoma by its form of appearance only. It is a well known fact that the granulating inflammation in general occurs in two forms, in a pathologic or anatomic sense as well as clinically. The one is a diffused exuberation of granulation tissue, while the other is the formation of the

socalled inflammatory granuloma. As long as it is certain that trachoma is a kind of granulating inflammation, as it is generally accepted today; so it is entirely natural that in trachoma there is formed a tumorlike thickening of the conjunctiva, just as in tuberculosis, solitary tubercles are developed.

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SOLID EDEMA. REPORT OF THREE CASES.

WALTER BAER WEIDLER, M. D.

NEW YORK CITY.

The cases here reported were submitted to vaccine treatment and did well under it. Read before the American Ophthalmological Society July 9th, 1918. With four illustrations.

Solid edema of the face was a comparatively new disease to me until I found a reference in Albutt and Rolleston's System of Medicine, volume IX, page 183, describing it as a recurrent and later a persistent edematous swelling without pitting, and characterized as "Solid Oedema" by Sir Jonathan Hutchinson, involving the whole or limited portions of the face, such as the eyelids or one of the lips, and has long been known and described under such names as "recurrent erysipelas" (J. Hutchinson), "erysipelas persistans faciei" (Kaposi), "erythema persistans faciei" (Kreibush), "lymphangitis faciei" (S. MacKenzie), and as persistent lymphatic edema. There are recurrent attacks at short, long and irregular intervals, in which the skin swells, sometimes with redness and signs of inflammation but more often not. The part attacked becomes edematous in such a way that pitting on pressure is absent.

In many cases there are no febrile or other constitutional disturbances; only the local discomfort, such as the photophobia, lacrimation and eczematous eruption about the eyelids and nose, and interference with breathing and inability to cleanse and free the nares from the crusts and scales as was observed in cases 1 and 3. The first attack is usually the most severe, the later recurrences milder. The edema does not always clear up entirely between the attacks, especially is this true of the upper lip.

The etiology is not definitely settled, but the general impression is that the condition is due to a streptococcic infection, and that it resembles the recurrent attacks seen in the other parts of the body, such as the arms or legs; where it may induce in time a form of elephantiasis. In none of my cases here reported was the streptococcus found, but in all the staphylococcus pyogenes albus and aureus, and in case No. 2 there was a diplobacillus found.

There is evidently a direct absorption of the toxins elaborated by the

strepto- and staphylococci in the nasal mucosa, and this in turn causes the edema of the cellular tissues of the lids.

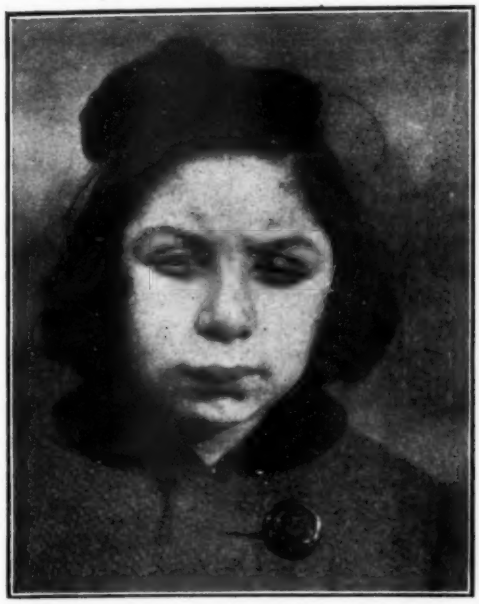

Fig. 1—Case 1. Showing marked swelling of left lids, upper lip, and right cheek.

cheeks and lips. In nearly all of the cases the nose has been found to be the site of the dermatitis, and a minute search should always be made in the nose, eyes, mouth or sinuses, for any possible source of the infection. Exposure to cold may favor the attacks.

DIAGNOSIS. — Recurrent localized swellings or edema of the lips, nose, cheeks and eyelids may simulate angioneurotic edema, and when the whole face is involved at first glance might suggest myxedema, leprosy, dropsy or pernicious lymphedema.

Kriegedema reported as occurring among some of the Russian soldiers in the present war affects, as a rule, the legs, thighs, genitalia and the eyelids. This is thought to be due to under feeding and especially to the absence of fats in the diet.

CASE 1.—Miss R. S., aet 12, Russian Jewess, states that when 5 years of age, eyelids, nose and upper lip were swollen, with some photophobia and lacrimation, which lasted for a few weeks. At 10 years of age a recurrence of this swelling which was more limited to nose and upper lip. She was told by one physician, who saw her at this time, that it was due to a "boil" in the nose. But the school doctor, who also saw her at this time, said it was erysipelas. About six months before she came to the Manhattan Eye and Ear Hospital, she was treated at the New York Skin and Cancer Hospital for several months, but without any relief.

February, 1916, when I first saw her, the condition was as follows: A very marked swelling of the upper and lower lids of both eyes. Severe photophobia and lacrimation, with blepharitis. Some swelling of both cheeks, and the nose was swollen to about one-half again its normal size. The nares filled with crusts and scales with some discharge. The nose was tender and painful to touch. The upper lip was enormously enlarged, and the affected parts of the face were firm to the touch. There was no pitting on pressure and there was little or no redness.

The urine, Wassermann and von Pirquet were all negative. The report from the rhinologist gave us no mate-

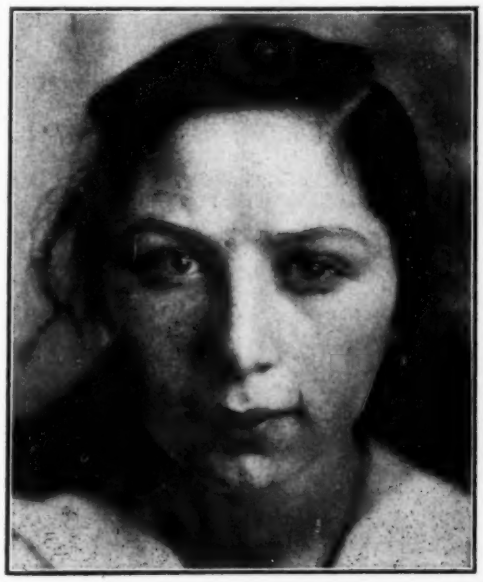

Fig. 2.—Case 1. Showing the patient one year later.

rial help in making a diagnosis of the trouble. She was referred to the laboratory to have a culture made of the nose, and the report came back that a pure growth of the staphylococcus pyogenes aureus was found. A vaccine was made and the injections were given.

Four days after the first injection was given an abscess at the site of the injection followed and was later opened and drained. These injections were continued over a period of about two months with a gradual subsidence of all of the ocular symptoms and the swelling of the nose, cheeks and lips gradually disappeared.

There was some douching of the nose by the patient, but no other treatment was given after the vaccine was started. I did not see the patient again until the fall, and the face was apparently normal.

There has been no acute recurrence of the trouble.

Case 2.—Miss J. G., aet 9, Italian parentage, family history negative, has had measles, scarlet fever and pneumonia. Had been under treatment for phlyctenular keratitis two years previously and was cured by the use of tuberculin injections. Returned to the clinic with a recurrence of the keratitis and associated with this condition was a marked swelling of the left cheek, nose and the upper lip. About the openings of the nares was some redness, scabbing and scaling of the skin. There was some tenderness of the nose on palpation.

The present trouble began in September, 1917, with bleeding from the nose, which was shortly followed with swelling of the upper lip and later extended into the left cheek and lids. Was treated by her family physician, who gave tonics and ointments with no improvement. This condition has lasted about five months with recurrent attacks, but the swelling of nose and lip never entirely disappeared.

A culture was made from the nose and the staphylococcus pyogenes aureus and a diplobacillus were found, and a vaccine was made.

Injections were given on the following dates:

4. 27. 18, vaccine gtts IV.
5. 4. 18, vaccine gtts VI.
5. 8. 18, vaccine gtts VIII.
5. 11. 18, vaccine gtts X.
5. 16. 18, vaccine gtts XII.

Patient was then referred to Bellevue for continued treatment.

5. 25. 18, vaccine gtts XIV.
6. 1. 18, vaccine gtts XIV. followed by local reaction.
6. 15. 18, vaccine gtts XIV.
6. 23. 18, vaccine gtts XV.

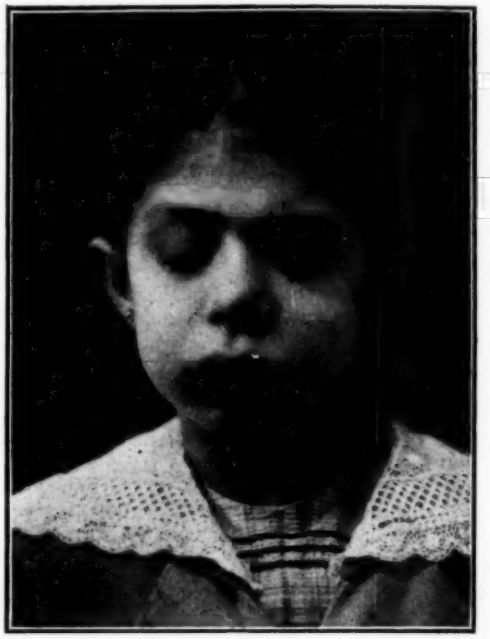

Fig. 3.—Case 2. Showing great swelling of lips and nose. Some swelling of both lids.

Patient was given atropin locally for the keratitis with the injection of tuberculin. The eye symptoms were relieved in about a week, and the swelling of the face gradually disappeared. During the treatment of this case cultures were made from time to time after she was referred to Bellevue, and the staphylococcus pyogenes albus was found; but the first made vaccine was continued.

Her brother, who brought her to the clinic, had had recurrent attacks of

phlyctenular keratitis, and was given tuberculin with relief of the condition. Some trouble with his nose caused us to make a culture. We found the Klebbs-Loeffler bacilli. He was given antitoxin and referred to the Willard Parker Hospital for treatment, and was discharged three weeks later, at which time his nasal cultures were negative.

CASE 3.—Mrs. F. P. U., aet 48, family and personal history negative, except for scarlet fever in childhood, and recurrent attacks of a condition that was diagnosed as erysipelas.

First attack at 15 years of age, involving head and face, hair fell out after a very severe attack.

Second attack at 18 years of age, illness lasting about two weeks, affecting face and head. During the next few years she would have recurrence of the erysipelas eruptions on face, especially affecting the eyelids, nose and mouth. The tear ducts and nose began to give trouble. Difficult breathing and more or less constant epiphora.

Nasal inflammation extended to pharynx and larynx, causing a cough the year around. The nasal and throat trouble had been a constant source of annoyance during all these years. The nose condition became so bad that a radical operation upon the ethmoids and frontal sinus was advised, but was refused. Paralysis of the facial nerve on the right side about five years ago, which was cured after six months of treatment.

Patient was referred to Dr. George MacKee for a dermatologic diagnosis, by Dr. Lane of New Haven, Connecticut, who in turn referred the patient to me for a nasal and ocular examination. X-Ray examination by Dr. MacKee showed the accessory sinuses to be normal. "The only suspicious area that he found in the alveolus was at the apex of the superior right second bicuspid. This tooth should be carefully investigated."

I found at this time that the entire nose was somewhat swollen, especially across the bridge of the nose. There is some redness with small circumscribed elevations, yellow at the center, but not truly pustular. Considerable redness and some swelling of the tip of the nose, local heat, and some tenderness on pressure. A considerable number of these papillary elevations present a scaling and glazing of the skin. There is a deeper redness where the affected area joins the more normal tissue of the nose, and extends along the cartilaginous septum, and involves part of the upper lip, which also is slightly swollen. The redness extending into both nares with a marked swelling of the central septal division.

Fig. 4.—Case 3. Showing swelling of nose and upper lip. Great redness, scabbing of the skin of nose and upper lip.

Dryness with scales and crusts in the nose which have existed off and on for the past 25 years. Has had more or less distinct nasal trouble during that time, which has progressively grown worse and no treatment seems to have had any curative value, only partially relieving the symptoms. The present attack has existed for about three or four months. Has pain deep in the nose and superior maxillary bones, at times.

Ears have discharged since an attack of scarlet fever and about 3 years ago

was given a "colon bacilli" vaccine, but reacted most violently to the injections which were continued over a period of three months.

A culture was made from both nares and a pure growth of staphylococcus pyogenes aureus was obtained, and a vaccine was made and the following injections were given:

4. 29. 18, vaccine gtts. IV.
5. 2. 18, vaccine gtts. V.
5. 6. 18, vaccine gtts. VI.
5. 10. 18, vaccine gtts. VII.
5. 15. 18, vaccine gtts. VIII.
5. 23. 18, vaccine gtts. X.
6. 3. 18, vaccine gtts. XI.
6. 10. 18, vaccine gtts. XII.
6. 17. 18, vaccine gtts. XIII.
6. 23. 18, vaccine gtts. XIII.

There was local treatment of the nose during the period of the injections, consisting in a thorough cleaning with alkaline spray, and applications of a 40% solution ichthyol, later a solution 50 grain silver was applied high up on the middle turbinate, with a 100 grain solution of silver about the nares, and on the surface of the nose. X-Ray was used once a week. There has been a complete relief of all nasal obstruction, and the skin surface of the nose has lost the scaliness and redness and appears to be gradually becoming like the rest of the skin of the face.

NOTES, CASES, INSTRUMENTS

BLUE SCLEROTICS, A NOTE UPON ASSOCIATED OTOSCLEROSIS.

FRANK A. CONLON, M. D.

LAWRENCE, MASS.

In 1913 I published (1) "Five Generations of Blue Sclerotics and Associated Osteoporosis" and thought my investigations of this family had been complete. After reading Bronson's article (2) on "Fragilitas ossium and its association with blue sclerotics and otosclerosis." I took the first opportunity presenting itself to examine my family for the possible associated ear condition.

I was very much chagrined to find that I had overlooked this part of the symptom complex which we now know includes blue sclera, a marked tendency to spontaneous dislocation, sprain, and fracture; small stature; and otosclerosis.

I, however, take some consolation in the fact that such a careful observer as Peters of Rostock overlooked even the tendency to fractures in his first publication, and not until I had questioned him did he discover it (3).

The father of this present generation reported by me I find has otosclerosis, and all of his family who had blue sclerotics were also deaf, and those who had normal colored sclera had normal hearing. The deafness in all cases coming on after thirty.

The age that the deafness developed in these cases is suggestive, if not conclusive, that these were also cases of otosclerosis.

None of the five girls in my family show any evidence of otosclerosis, but considering that not one is over thirty is not so remarkable.

Since publishing my article in 1913 two children have been born one with and one without the blue colored sclera. One month ago a member of the family received a bad fractured knee from rather a slight trauma.

As we are now fast becoming a military nation I think we might accept Peters' suggestion that all cases of blue sclerotics be exempt from military service.

Bronson reports out of a family of four generations, thirty-four of whom he examined, twenty-one had gray-blue sclerotics—twenty suffered from fractures and seven members had progressive deafness which was found to be otosclerosis.

Van der Hoeve and de Kleijn (4) were the first to notice otosclerosis in connection with this very interesting anomaly. Out of eleven without blue sclerotics, all were deaf and ten had broken one or more bones.

In their second family three members were deaf from otosclerosis.

Van der Hoeve says: "The blue sclera is observed when the anomaly is there; the fragility of the bones, on the contrary, can be present unobserved because an accident is necessary to put it in evidence, and deafness is progressive, so that it is not perceived before a certain age—so altho all the symptoms of the syndrome may be present only the blue scleras are noticed.

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CANTHOPLASTY.

FRANK A. MORRISON, M. D., F. A. C. S.

INDIANAPOLIS, INDIANA.

In the April issue of this journal Dr. J. S. Wyler, of Cincinnati, describes his method of performing canthoplasty by utilizing the entire thickness of the skin to make the flap. For several years the writer has used the cuticular layer with success and reports the method for the benefit of any one who should desire to try it. Several drops of a four per cent solution of cocain are first dropped into the conjunctival sac and then the region to be operated upon is anesthetized by infiltration with a one-half per cent solution of novocain, to which is added a few drops of adrenalin. The needle is entered at the commissure, splitting the skin, and pushed templewards for approximately a third of an inch, raising the skin in the usual bleb of infiltration anesthesia.

A cataract knife is now entered at the commissure, splitting the skin, and pushed outward for approximately a third of an inch. All this time, of course, the skin is kept on a stretch. The knife is at all times perfectly visible beneath the cuticle and this layer is separated from the cutis by "working" the point and body of the knife from side to side until the skin is split into two layers. Next an incision involving the cuticle only is made, commencing at a point about one-eighth of an inch above the commissure and passing upward and outward for a third of an inch. A similar incision starts the same distance below the commissure and extends to a like distance downward and outward.

The little flap now formed is reflected toward the temple, and then all remaining structures, including the deep skin layer, with muscle, etc., is divided with the scissors in the usual way. Finally the apex of the cuticular flap is sutured with fine silk to the middle of the original canthus and one similar suture is placed at the upper and one at the lower edge of the flap to prevent curling. The operation is easy of performance and painless. In very small children, where a local anesthetic is not used, I have infiltrated the skin with normal salt solution and adrenalin to facilitate the separation of the layers.

BEST WAY TO STRAIGHTEN CROSS EYES

DAVID W. WELLS, M. D., F. A. C. S.

BOSTON.

Of the multiplicity of operations for correcting heterotropia, it seems fair to assume that some are more successful than others, and among those some, is it unreasonable to presume that one may be the best? Probably most operators continue the method which they have found successful and in which they have developed the most skill. If one were to approach this

question anew, how could he obtain the correct answer?

The inquirer would find equally acknowledged authorities advocating tenotomy of the strong muscle, tucking of the weak muscle, resection of the weak muscle, advancement of the weak muscle either with or without tenotomy of the antagonist, capsular advancement (Fox), musculo-capsular advancement, or some modification of some popular technic.

It must be evident that the only way to settle the question is to compare the results, and in order to do this the results must be tabulated on some sort of uniform schedule which will make comparison possible.

The report of Dr. Fernandez on his experience with the Reese operation in the American Journal of Ophthalmology, June, 1918, is an example of insufficient data. It gives the angle of deviation (probably perimetric) before operation, but what after? Simply "good result," and "failure." Now what constitutes a "good result" is open to various answers. Many a patient is satisfied with a partial correction and considers it a "good result," and it is possible the operator may share this opinion. What is a "failure?" Was no change produced? Was it a partial correction? Were the eyes straight immediately and crossed later? Or was the eye lost?

Four years ago Wells and Sternberg published* a report of sixty-nine cases, operated by the Wells modification of the Worth advancement, giving the following data:

Indication of case and eye.
Deviation with perimeter, degrees.
Constant, (c). Occasional, (oc). Alternate, (alt).
Age of patient.
Age of onset.
Refraction with cycloplegic.
Vision.
Glasses ordered.
Time worn.
Deviation with Glasses on.
Fusion Training.
Previous Operations.
Advancement.
Antagonist Muscle.
Anesthetic.
Results: Perimeter, Phoria, Stereoscopic.
Remarks.

It was hoped that others would follow this example so that the results might be studied comparatively. Presumably all of us would like to adopt the method which gives best results, but this cannot be decided until results are reported on uniform schedules. Our national societies should adopt such a schedule. Probably the one presented would not meet with general approval, but it would seem possible to agree upon some form which would satisfy a majority. Naturally it is first necessary that there be some general desire to secure a correct answer to the question propounded. It is quite possible that such a study would show that one technic is best for exotropia, another for esotropia, one for high degrees, another for low degrees, but these details would be evolved once the importance of reporting results on uniform schedules were recognized.

*Journal of Ophthalmology, Otology, and Laryngology, September, 1914.

SOCIETY PROCEEDINGS

AMERICAN OPHTHALMOLOGICAL SOCIETY.

Fifty-fourth Annual Meeting.

NEW LONDON, CONN., JULY 9 AND 10, 1918.

President, DR. WILLIAM H. WILDER of Chicago.

Solid Edema of Lids and Face.

DR. WALTER BAER WEIDLER, New York City, read a paper describing this condition and reporting 3 cases with the results of treatment, which is published in full, p. 722.

DISCUSSION.—Dr. S. Lewis Ziegler, Philadelphia, Pa., had published a case of a similar nature in 1911. Cellular infiltration with hemophilic extravasation had come suddenly into the lips, and along the side of the face and the nose. Later there was a similar infiltration in the conjunctiva. A partial diagnosis of sarcoma of the antrum had been made. The underlying cause was chronic constipation. He had seen the patient in a similar attack some years before. On thyroid extract and suprarenal extract, with a liberal use of cathartics, there was some improvement; but it was slow. As she had marked nasal obstruction, it was finally decided to cauterize the inferior turbinate and the septal puff. The resumption of free breathing caused prompt and complete absorption of the hemic infiltrate.

Studies of Eyeballs Lost After Sclerocorneal Trephining.

DR. W. GORDON M. BYERS, Montreal, Canada, reported that in these cases the histologic findings explain the causes of the failure of the Elliot operation. In the first case, that of a woman aged thirty-one, a sclerocorneal trephining was done, with a complete iridectomy. No complications followed. Nine months later the patient returned, stating that the eye had become suddenly painful shortly after she had left the hospital; but that pregnancy and childbirth had prevented her return sooner. Examination showed a marked congestion.

The bleb over the opening was collapsed, the lens dislocated, and the broken conjunctival covering mixed with uveal tissue. In the area of the coloboma upwards, occupying about one-third of the space, was a small, tongue-shaped patch of corneal infiltration, with its base resting on the limbus. Enucleation was performed. The microscopic examination revealed changes that were, in an exaggerated way, those that are characteristic of healing corneal wounds, with a marked response to injury or infection on the part of the uveal tract. In contrast to the second case, the dislocation of the lens and the tearing of its capsule in this case were attributable to the sudden reduction of intraocular tension following collapse of the bleb.

The second case was that of a lady of eighty-three years, very active for her age, in whom a sclerocorneal trephining was performed with no complication except a slight difficulty in doing a partial iridectomy. The patient was perfectly comfortable until the morning of the eighth day following the procedure, when there were three short separate periods in which the patient saw light flashes, ushering in complete loss of sight. The eye became more and more irritable, with greatly heightened tension, necessitating enucleation. The specimen showed an ectatic scar, covering dome-like, the site of the trephine opening.

The point of interest in this case was the vitreous prolapse. A brief study of the specimen showed clearly what must have been the course of events leading to its occurrence. The trephining was too peripheral. During the first few days, the uveal tract was sufficiently strong to support the intraocular structures; but it gradually stretched under pressure; and finally gave way on the eighth day, with consequent rupture of the annular fibers and hyaloid membrane, dislocation of the lens, and renewed tension following vitreous prolapse. The flashes of light were not due to retinal hemorrhage, as was supposed at the time of

their occurrence, and no evidence of hemorrhage was found in any part of the specimen.

The lesson here is obvious. Especially in those advanced cases, in which accidents of this sort are prone to occur, Col. Elliot's advice in regard to placing the trephine opening in corneal tissue should be followed to the fullest extent, in order to guard against the occurrence of the changes described. On the other hand, such procedure offers the best chance of securing unadherent iris for excision.

A third case of the kind had been seen, but the enucleated globe could not be prepared and studied in time to include the results in this report. He desired that in discussion members might state how far they felt justified in operating when only a small amount of vision remains.

Discussion. — Dr. F. H. Verhoeff, Boston, Mass., had examined a number of eyes that had been trephined unsuccessfully; and in the majority of them found that the trouble had been an injury to the lens. In a few cases of hemorrhagic glaucoma, the trephine hole had been closed by proliferation of tissue; but in the others, the result was due to injury of the lens, either by the instrument or capsule rupture. The small injury to the peripheral lens was unsuspected by the operator. Not until the eye was removed was it discovered. The whole trouble in these cases had been irritation by the cortical matter as it came from the lens. It makes a characteristic histologic picture; not an intense reaction, but a marked cellular exudation, associated with necrosis of the iris. In all the cases, the anterior chamber has become obliterated. The aqueous has been lost, and the space filled by this exudate of chronic inflammatory cells.

Dr. Walter L. Pyle, Philadelphia, Pa., had recently a case of an unfortunate result from sclerocorneal trephining with prolapse of the iris. He did a posterior sclerotomy, excised the cicatrix, released the iris, and extracted the lens. Since then, he had never attempted the Elliot operation, but preferred in hopeless cases a liberal posterior sclerotomy, releasing a drop of vitreous.

Dr. Edward Jackson, Denver, Colorado, had seen two unsuccessful trephinings that seemed due not to any error in the placing of the opening, but to the character of the cases. They were cases of chronic inflammatory glaucoma, that had gone on to practical blindness before operation was done. Altho there was no question about the very high tension at the time of the operation, they were essentially uveal inflammations; and pursued a course that did not seem to be materially affected by the Elliot operation. Neither of these eyes was enucleated. They finally quieted down, with renewed high tension, but without pain. The operation gave relief from pain, but did not seem to alter the course of the disease.

Pathologic Manifestations of Tuberculous Kerato-Iritis.

Dr. Fred Tooke, Montreal, Canada, reported the results of microscopic study of four eyeballs presenting the lesions of tuberculous kerato-iritis. The patients were women whose ages ranged from 18 to 48 years, who had suffered from chronic iritis following trauma, years before they had been affected by this disease. The diagnosis had been confirmed by use of tuberculin. Nodules were found at various points in the iris, and there was deep corneal infiltration in every case. In two of the eyes there was corneal ulcer and necrosis; and in two of them cyclitis. Some of the retinal veins were markedly dilated. Perivascular tubercule was discovered in one. There were numerous new-formed vessels in the cornea.

Discussion. — Dr. F. H. Verhoeff, Boston, Mass.: I should congratulate Dr. Tooke for availing himself of the opportunity to examine these cases. There have been few cases of this type examined, altho many eyes must have been removed.

Experimental tuberculosis has no bearing on ocular tuberculosis as we

see it in man. Normal rabbits with virulent bacilli injected into their blood have small metastatic foci, marked in the iris. In the human being who has had tuberculosis for a long time, the metastasis does not overwhelm with tubercle bacilli.

My work was based on the supposition, indicated by microscopic examination, that lesions of tuberculosis in man are due to the bacilli which get into the aqueous humor; and, from there, are deposited in different parts of the eye; and that they are not due simply to tuberculous emboli in various vessels of the eye. Lesions are due to the bacilli being deposited from the aqueous in various places, notably in the infiltration angle and on the surface of the iris. The picture is very different from that in blood metastasis, as we ordinarily understand it, and that which Stock got. It is impossible to reproduce in animals the condition found in man. The nearest that I could get was to inject dead bacilli; which do not reproduce themselves, or cause the active lesions produced by the living ones.

Recently it has been shown that the retinal hemorrhage of young subjects is due to tuberculosis. Fleischer concluded that it was due to bacilli, not coming from the blood current directly, but getting into the retina from the anterior part of the eye, and being carried along the perivascular channels. If that is so, it would be in line with tuberculous sclero-keratitis and iritis. I have a number of cases of this type of tuberculosis, associated with tuberculous iritis and keratitis.

Dr. John E. Weeks, New York City: I should like to call the attention of the gentlemen to the rather strong resemblance of certain cases of so-called disciform keratitis to tuberculous lesions of the cornea. Dr. Tooke tells us that on the posterior surface of the cornea there is either a multiplication of the endothelial cells or a collection of lymphocytes, or both, giving the appearance of deep-seated punctate keratitis. Now in the two or three examinations of corneas with disciform keratitis, the pathologic findings have been those of small cell infiltration, with a caseous degeneration or necrosis of the corneal lamellae, and in parts a disturbance of the epithelium.

Those who have studied this form of keratitis at its inception, find that the proliferation takes place in the superficial lamellae immediately beneath Bowman's membrane. The epithelium extends downward; and after a time, we have a whitish necrotic area, with spots in the parenchyma of the cornea, and in some cases, a collection on the posterior surface of the cornea. These collections microscopically consist of deposits such as those that Dr. Tooke has mentioned.

Dr. Tyson, in 1915, advanced the opinion that these conditions were tuberculous; and I recently made a clinical study of some cases, from which I also formed the opinion that they were tuberculous. I should like to call attention to this supposed tuberculous origin of exogenous infection. The insensitiveness of the cornea in these cases is due to the absorption of toxins and their effect on the terminal filaments of the fifth nerve.

Cataract in Retinitis Pigmentosa.

Dr. Arnold Knapp, New York City, pointed out that a practically constant complication of retinitis pigmentosa in the later stages is a cataract of the posterior layers of the lens. This has usually not been considered amenable to treatment, on account of the severity of the fundamental disease. Doyne, however, was struck by the remarkable improvement in sight which followed the removal of the lens in these cases. Knapp reported four cases operated on with good visual results, vision being improved from 20/200 or less to 20/50 and 20/70, and from 3/200 to 15/200. The operation done was the ordinary cataract extraction, two of them having been extracted in the capsule. In each case the Wassermann had been negative. There was no complication in the recovery after extraction of this form of cataract; and the results had been so favorable that he felt the operation should be urged

upon the attention of ophthalmologists. There had been no improvement in the visual fields.

Discussion. — Dr. Herbert Harlan, Baltimore, Md., reported a case operated on about twenty years ago. The patient had long known that he had retinitis pigmentosa. He had consulted several oculists, and they all told him that he would eventually go blind, and that nothing could be done for him. His vision had become very bad. In walking on the street in the light, he could not see anything, such as a hole in the pavement. He had been training himself for blindness for years, so carefully that he was able to keep his position in the Pension Department through various administrations. There seemed to be no reason why the central cataract should not be removed, since it was shutting out the only vision he had. There was no difficulty about the operation. When glasses were adjusted, he had nearly 20/20 vision. He said that he had never before been able to see from the inside of the house the rain falling on the outside. A month afterwards, he came for an operation on the other eye. The operation was satisfactory; and the man was living last year, still retaining his central vision.

Dr. William H. Wilmer, Washington, D. C., had recently seen Dr. Harlan's patient, who is still living and holding his clerical position. His experience in these operations tallies exactly with Dr. Knapp's. It is a very successful operation. One gets the power to put on a strong convex lens and get magnification. People who would otherwise have to give up their vocations in life are thus able to continue their work. He had a number of these patients who were following their vocations in this way, when they would otherwise be on the shelf.

Dr. Harlan's patient had consulted him a number of times during the last few years. There is a slight capsule there, but so slight it would not be advisable to do discission. The man has epilepsy and all sorts of physical disabilities, but he has a bright mind. His son leads him to the office every morning, and he works all day. He wears cylinder 3. D., and his spherical for reading has been gradually increased until it is now 20. D. He gets his nose very close to the paper, and continues his clerical work. He has for night reading a frame devised by Dr. Koller, with a rubber arrangement and a lens at the end. By getting close, he can read the paper. He has still, with his great physical disabilities, a central vision of 20/100. Certainly this operation has been quite as successful as any other operation in a similar complicated condition.

Microscopic Findings in Coralliform Cataract.

Dr. F. H. Verheoff, Boston, Mass., pointed out that no case of coralliform cataract has hitherto been examined microscopically. The examination of the present case showed the characteristic opacities to be due to the presence of large crystals in the lens. These crystals did not consist of cholesterin, as has been assumed, but of lens protein. Coralliform cataract is not identical with spindle or axial cataract. Its possible relation to lamellar cataract and rickets was discussed and an explanation of lamellar cataract suggested as due to deposits in the lens due to defective metabolism with regard to calcium compounds. It might be that the opacity resulted from the undue persistence of lipoid particles, normally present in the fetal lens, the absorption of which left the vacuoles.

(*To be continued*)

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA.

April 18, 1918.

Dr. S. Lewis Ziegler, Acting Chairman.

Buphthalmos.

Dr. Luther C. Peter reported the case of an Italian child, five months old, first seen when one week old, when the conditions were about the same as now.

Both corneas were large, 15 mm. in diameter, bluish in color, with central opacities. The sclera was bluish in color and as a rule free from redness. The anterior chamber was very deep, as the mother said, "the pupil was too far back." The pupils were large even when under the effect of eserin. The iris was normal in appearance, and fundus details were not obtainable. Tension was increased. The child had good light perception and apparently good projection.

In the family history it was interesting to note that one brother, now six years old, had a similar condition at birth. The left eye was removed when one year old, and the right now is sightless and in an irritable state, although not painful. There is a distant relationship between the parents — cousins three times removed.

Although the mother's Wassermann was negative, the treatment had consisted in mercurial inunctions and a weak yellow oxid salve and eserin locally. The corneas are now clearer than after birth and the eyes are less sensitive to light.

Probable Intraocular Tuberculosis.

DR. PETER detailed the history of a case of intraocular growth.

Catharine G., aged eight and a half years, the fourth of five children. Had measles one year ago, otherwise was a healthy child. Five weeks ago the mother accidentally discovered that the child was blind in the right eye. Never complained of pain. Admitted to the Samaritan Hospital a few weeks ago. Examination showed normal pupillary responses and the external appearance of the eye was normal. When the pupil was dilated, however, by oblique illumination, a grayish-white mass was found midway between the lens and the posterior pole of the eye down and to the outer side. Projecting out and to the nasal side was a thin semitransparent exudate in the vitreous body. This prolongation was fan-shaped and had the appearance of a cactus-like growth. There were numerous fine opacities of the vitreous and a red reflex was obtainable up and to the nasal side.

The child apparently did not recognize even hand movements at any distance. Transillumination was fairly good through this opaque mass. Bloodvessels were not visible at any time. No fundus details were obtainable by means of the ophthalmoscope. The Wassermann was negative and the general physical examination showed a practically normal child. The tuberculin test was slightly positive, but not decidedly so. There was a slight tendency to a rise in the temperature after the injection of one ten-thousandth, one five-thousandth and one two-thousandth of a milligram of T. R. Mulford No. 1. She received hot packs daily but there was apparently no improvement until after the administration of tuberculin. During the last two weeks, a fundus glare has been visible over a larger area and the child now sees hand movements at 2 feet and occasionally a retinal vessel can be dimly outlined.

The diagnosis has been in doubt. The age of the patient, the appearance of the growth, the absence of the vessels, and the apparent improvement have practically eliminated glioma as an etiologic factor. The slight positive tuberculin reaction and the apparent improvement since tuberculin has been administered have tended to confirm Dr. Peter's suspicions of the tubercular character of this condition. Retinal detachment and cysticercus can be excluded.

DISCUSSION. — Dr. Zentmayer said that he had had the opportunity of seeing the case thru the courtesy of Dr. Peter when it first came under Dr. Peter's care. The age of the patient, the minus tension, the absence of a tumor mass and the history that it followed an attack of measles made him suspect that it was a case of detachment of the retina of the class first described by Nettleship or that it was one of tuberculosis.

Dr. Hansell said the morbid process now apparent in the vitreous bore no resemblance to either glioma or pseudoglioma, altho when it was in the formation stage those two affections were worthy of consideration in deter-

mining the diagnosis. The latter has been reported as a sequel of the exanthematous fevers. When present it leads to rapid destruction of the intraocular tissue. Here there was a most unusual, probably fibrous formation in the vitreous, the origin of which was difficult to determine.

Growth from Ciliary Body After Cataract Extraction.

Dr. G. Oram Ring reported the case of Mrs. R., aged fifty-four years, who was operated upon seven years ago for cataract. A combined extraction, with later secondary incision of the capsule was the procedure adopted.

She presented herself on July 11, 1916, and the cataract in L. was extracted by one of Dr. Ring's colleagues.

During visits for the examination and treatment of L. there was noted a minute growth lying on the opaque capsule of the right eye, apparently proceeding from the ciliary body out and down and pressing the iris forward slightly. The color was a grayish yellow with a more definite yellow point above. The growth continued slightly for nearly two months, but the eyeball remained white and comfortable. Corrected vision is 20/30.

The case was shown because here again there was some difference of opinion as to the procedure indicated. The writer declined to advise enucleation, and upon watching the eye for the last three months no change could be recognized in its appearance.

The question of diagnosis involved a decision as to the malignant character of the growth. The writer inclined to its nonmalignancy.

Unusual Case of Glaucoma.

Dr. Luther C. Peter gave the history of the following case: R. L., aged thirty-five years, single; a mulatto, suddenly developed pain and redness of the right eye June 28, 1912. He was treated in the South from June to December for iritis. The history of this early attack was quite vague, but apparently atropin was used continuously from June to December, after which eserin was employed. Prior to the onset of the trouble, during the winter of 1911, the patient suffered from rheumatism. She came to the Polyclinic Hospital August, 1913. At that time she was suffering from an absolute glaucoma of the right eye and there was considerable cupping of the left disc, altho the fields were practically normal. A broad iridectomy was performed on both eyes. As the right eye continued to be painful, one year later, a sclerocorneal trephining was performed on the right eye by the late Dr. Wendell Reber. Since then the right eye has remained quiet and has been entirely painless. The patient had at times, previous to the iridectomy of the left eye, some vague pains but never knew that her left eye was involved.

The condition at present is as follows: Tension varies from 20 to 25 mm. Hg. There is no pain, and no pericorneal redness. The fields are interesting because they show a typical Bjerrum sign, namely, a large reentering angle which extends to and includes the enlarged blind spot of Marriotte. The field has remained stationary during the past year and a half. The ophthalmoscopic examination shows typical glaucomatous cupping which includes a good part of the disc and extends to the margin of the disc on the temporal side. Vision 20/20.

The points of interest in the case were:

1. The early history, which was very vague, but because of the bilateral character of the glaucoma, it was more than likely that the right eye began as a glaucoma.

2. The early age of onset. The patient was about thirty years of age when she first noticed the loss of vision. It is more than likely, therefore, that the first evidence of disease dates back considerably further. Just at what age the trouble began is difficult to say. It must, however, have been considerably under thirty years of age.

3. The Bjerrum sign. This sign, Dr. Peter thought, was present in a great many more patients than is usually supposed.

4. The value of the broad iridectomy was here emphasized. He performed the iridectomy August 5, 1913, almost five years ago, and the patient had lost since then very little of her visual field.

Regeneration of a Cornea Partially Lost During Gonorrheal Ophthalmia.

DR. J. MILTON GRISCOM gave the details of a case of severe corneal ulceration secondary to an attack of gonorrheal ophthalmia. The ulcer involved the entire cornea with the exception of a zone about 2 mm. wide at the upper limbus, and penetrated as far as Descemet's membrane at one point in the lower half of the ulcerated area, but did not perforate it. The ulcer eventually began to heal and the cornea to regenerate from the uninvolved strip at the upper limbus. Instillations of eserin, alum and adrenalin (1-1000) were used during the process of repair. At the time of the report six weeks after the beginning of ophthalmia, the upper third of the cornea was entirely clear, the middle third showed a faint superficial haze, and the lower third was somewhat more opaque. The patient was conscious of increasing clearness day by day, his vision being 14/200. Dr. Griscom thought the case to be one of true regeneration of the corneal stroma following ulceration.

DISCUSSION.—Dr. Zentmayer thought the repair of the cornea in this case had been very remarkable. He saw the case repeatedly during its stay in the Wills Hospital and at one time, while the conjunctival inflammation was still very intense the destruction over a large part of the cornea seemed to extend down to Descemet's membrane. He was sure, had the case been his, there would not have been a case of regeneration of the cornea to show.

Dr. Hansell said the use of adrenalin in the treatment of corneal ulcers was practised extensively by the late Prof. Stanculeanu, altho it was not sure that he claimed originality in this method.

During Dr. Hansell's stay in Bucharest, in the summer of 1914, he observed a number of cases, both traumatic and secondary, purulent and non-purulent, in which the only treatment, other than cleansing, was adrenalin 1-1000 dropped into the eye every two hours. The efficacy of this drug was demonstrated in about one-half of the cases.

Unusual Case of Steel Injury.

Dr. William M. Sweet exhibited an unusual case of steel injury. The metal, 4x2 mm., passed thru the lower lid at the inner portion, 1 cm. from the margin, and was located by the X-rays to the temporal side of the orbit, below and back of the eyeball. From the history of the injury the steel must have passed in a slightly upward direction thru the eyelid, probably wounding the eyeball at its lowest portion, and then was deflected downward to the situation indicated by the radiographs. Vision was not affected for several hours after the accident, and at examination equalled good light projection. Only a grayish reflex was seen by the ophthalmoscope.

Gunshot Wound of the Eye.

DR. HOWARD F. HANSELL reported the following case: William H., aged nine years, while at play with boy friends on February 12, 1918, was struck in the left eye with a small B. B. bullet from an air gun. General family history, personal history and general physical examination negative. Upon admission a few hours following the accident the anterior chamber was filled with blood, the eye intensely injected but no rupture of external tunics was apparent. The usual local treatment was ordered and an X-ray immediately taken which was negative. As the blood in the anterior chamber absorbed, it was found that an iridodialysis was present down and in with traumatic cataract, the capsule having ruptured and the swollen lens had partly filled the chamber especially at the upper two-thirds.

The pupillary fibers of the iris at the lower edge were ruptured and the iris adherent to lens capsule despite the active use of atropin.

The muddy appearance of the iris, a somewhat cloudy anterior chamber, swelling of lens, tendency to rise of tension, intense watering and dread of light with some lacrimation and photophobia in the fellow eye led to a divergence of view as to the best procedure to be adopted.

During a temporary absence of the writer for a few days the atropin was continued beyond the proper point and the cornea became steamy with definite rise of tension notwithstanding considerable absorption of swollen lens matter. Eserin was at once ordered, followed by a clearing of the cornea and the marked amelioration of all symptoms in each eye. As light perception and projection are now definitely present it was felt that the operation upon the remaining capsule was likely to result in a saved and probably useful eye.

J. Milton Griscom, M. D.,
Clerk.

ABSTRACTS

Papers that require early attention are here noticed. The systematic review of all current literature is to be found in the Digest of the Literature.

V. Morax.—Clinical Notes on Some Atypical Signs of Subacute Glaucoma. —Annales d'Oculistique, February, 1918.

It is a well known fact that acute glaucoma can occur unrecognized for some time, the reflex symptoms which generally accompany it, cephalalgia, vomiting, malaise, etc., obscuring the eye trouble. This also occurs with subacute glaucoma, which may remain undetected, even by the ophthalmologist, for months and years, if the intraocular tension is not carefully ascertained.

Morax emphasizes the importance of recognizing the early symptoms of glaucoma, and describes some atypical forms of the subacute variety, beginning with uncommon symptoms. The classical signs, such as colored rings around artificial lights, foggy vision, supraorbital or temporo-occipital pain, dilatation of the pupil, disturbances of the accommodation, etc., are well known, and even dramatic literature has vulgarized them in France. But on the other side, there are some uncommon initial signs which it is necessary to detect as soon as possible in order to arrive at a correct diagnosis.

Morax describes two new ones: *orbito-facial* pain, simulating a deep bony pain, similar to that found in sinusitis and periostitis, and *lacrimation*. He relates the history of two patients afflicted with the former symptom. The first was a strong and well built man, 43 years old, complaining of headaches for 15 months previously. The trouble being attributed to stomach complaint, he was submitted to severe diet, but without any avail.

After one year the pain, intermittent at first, became continuous, and localized specially around the orbit. No lesion of the sinuses being detected and the Wassermann being negative, he was referred to the ophthalmologist. A careful examination of the eyes failed to detect any pathologic changes. Fundi were normal and visual acuity normal in both eyes. A neuropathic condition was diagnosed and the patient was going to be discharged, when Morax tried the tonometer, and to his surprise he found 60 mm. of tension in one eye and 45 in the other. It was then a true glaucoma developed without any ocular symptoms, vision remaining good all the time. Pilocarpin was used and the pain immediately subsided, confirming the true nature of the disease. Tension lowered to 28 and 23 mm.

The second patient was a woman 46 years old, who some months before had dimness of vision, to which however she did not pay any attention. She suffered a great deal from facial and orbital pains without any known cause. A tooth was extracted and the sinuses were examined. Referred to the ophthalmologist vision was found normal

in both eyes; visual fields normal; emmetropia, pupils reacted as usual, fundus normal. Tonometric examination revealed the cause of the trouble. R. T = 42 mm. Hg. L. T. = 22 mm. Pilocarpin instilled four times a day lowered immediately the orbito-facial pain; and after some days tension was R., 30 mm. and L., 24 mm. The effect of the drug decreased a good deal after two months of treatment and sclerecto-iridectomy was advised.

Of the other new symptom, lacrimation, he describes two cases. A man 50 years old, stalwart and well looking, sought advice for lacrimation which had lasted for two years, and came on from exposure to fresh air; but sometimes also indoors and when going to sleep. There was no visual trouble, no pain. Myopia of —1.25 and —1.75 was found. Correction gave normal acuity. Visual fields normal. Ophthalmoscopic examination detected slight cupping of the disc, not easily referable to hypertension. Lacrimal passages had only a stricture of the puncta, which after proper dilatation allowed an injection to pass freely into the nose without any reflux.

Intraocular tension, which to palpation seemed normal, showed with the tonometer: R. = 45 mm., and L. = 42 mm. Pilocarpin relieved entirely the hypertension, the tonometric readings descending to 28 and 26. Lacrimation disappeared when the tension lowered.

In another case an old woman complained of watering eyes, the trouble being as marked indoors as outdoors. But examination of the lacrimal passages failed to detect any abnormality. Inverse astigmatism in both eyes suggested the examination of the tension, which was found increased to 36 mm. in both eyes. Papillae slightly excavated. Vision 8/10 in both eyes. Pilocarpin relieved entirely the lacrimation.

These two symptoms may of course be found in cases of advanced glaucoma, but in that stage they have less diagnostic value.

M. U. T.

Suganuma. Pathologic Changes in the Choroidal Hyaloid Membrane and Retinal Pigment Epithelium. Nippon Gank. Zasshi, August, 1917.

With this a long article comes to its conclusion, but it cannot be abstracted in full. The author says with Wolfrum that the choroidal membrane consists of two lamellae, the lamina basalis and lamina elastica. The first is the basal membrane of the retinal pigment epithelium, and the second consists of a net work of elastic fibers of the choriocapillary layer. The plasma of the blood, which circulates in the intercapillary layer of the choroid, diffuses thru the lamellae into the outer retinal layer. Thus the latter and the pigment layer are nourished.

A narrow space exists between the lamella, which in the ciliary region contain fibrils, and there is commonly found here some pigment epithelium. In examination of 11 globes, he found in only one that more elastic fibers went to the optic nerve. The author is of the opinion that the relative retraction of the lamina elastica arose from a pull between the retina and the choroid from the optic nerve by the nerve fibers. This is also Heine's idea.

The pigment epithelium and lamina basalis are first destroyed in glioma, and then the lamina elastica is attacked; whereby the meshes of the network become larger and the tumor cells grow between, because of which the lamina becomes defective. Also a form of ulceration occurs during the choroidal tumor growth, the lamina gives way over a considerable area and becomes torn thru the stretching; therefore, bleeding may be observed. These spots become organized and shrink, following which the tumor often becomes constricted at its neck and secondary necrosis of its apex appears.

From the examination of many eyes of different types, the author has the opinion that the lamellae of the choroid is a limiting membrane, and acts as a protection against force. When the lamina basalis becomes changed in the pigment epithelium, the outer lay-

ers of the retina are damaged. But damage to the lamina elastica is more grave, for thereby the choroid capillary layer is destroyed; and this brings with it severe damage to the outer retinal layer.

The author has examined the pigment epithelial cells in many cases of various diseases, and has made some clinical experiments. As a rule, the pigment defect is connected with increase of pigment especially in the periphery. The retinal pigment changes arise from, 1st, direct penetration of pigment epithelial cells; 2nd, thru secondary proliferation from the choroidal wandering pigment epithelial cells; 3rd, thru transportation of the epithelial cells and free fuscin bodies thru the leucocytes and the lymph stream in the spaces between the vessels of the retina; 4th, taking up of the freed fuscin bodies thru the adventitia of the vessels and the glial tissues.

The author has also found that sclerosis occurs in glioma of the retina, and in leprous inflammation of the retinal vessels; which are first seen in the enlarged pigment epithelial cells. The author thinks concerning this that pigment degeneration of the retina is first a sclerosis of the vessels thru investment, by which the secondarily enlarged pigment cells become more sclerosed. True pigment from all sources is noted in the pigmented sarcoma of the choroid. In this the large round cells, according to Leber arise from the enlargement of the pigment epithelial cells; but the author has never found such a condition and therefore cannot corroborate Leber's statement. The glands seem to be composed of pigment epithelial cells in which the hematolysin becomes bluish, and which thru contraction, are surrounded by larger granular formations.

KOMOTO and H. V. W.

Steiger, A. Accidental Light on Myopia. Ann. d'Ocul., Vol. 155, p. 54.

Steiger, at the Ninth Annual Meeting of the Society of Swiss Oculists, expressed his opinion that emmetropia is not the normal refraction. Infants vary as to their refraction, and refraction itself varies with development, occupation and instruction. Lesions of the fundus exert an influence not well understood upon the refraction. Heredity plays its part, as well in hyperopia, astigmatism and emmetropia as in myopia. Myopia is not only a pathologic condition; it is also a biologic. States of refraction are probably established according to the three following laws:

(1) Biologic characters have not a distinct form and extent, but vary according to certain laws. (2) These variations have a greater or less tendency to progress, but are held in a certain average by selection and elimination. (3) This selection, this elimination, these variations are not present in the individual, but in a series of generations; they are phenomena of phylogenesis, not ontogenesis.

In the course of generations, the variability of refraction may increase this selection, may lessen or may cease entirely, and the eye may lose its functional perfection, and in certain families may go on to degeneration.

C. L.

J. Santos Fernandez.—How Should the Ophthalmic Surgeon Act with the Hopeless Cases.—Cronica Medico-Quirurgica de la Habana, April, 1918.

This subject has been well discussed at the XI International Congress of Ophthalmology held at Naples, Italy, on April, 1903, and before that date by Javal, who had lost an eye. Afterwards Von Zily and Eliaberg had discussed the subject. The author believes that one has to take in consideration the age and social condition of the patient, and although it is always good to have these incurable patients prepared to know their fate, one should be very careful and have pity on the sentiments of the unfortunate beings. If the patient is rich, the family should be told his true condition, but he himself should not be told, as not having to work, he can be kept piously fooled. But in cases of workers, the truth should be told, altho with some precautions.

F. M. FERNANDEZ.

American Journal of Ophthalmology

Series 3, Vol. 1, No. 10 October, 1918

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

Original papers and books for review may be sent to any member of the editorial staff. Reports of society proceedings, correspondence, and other scientific communications should be addressed to the Editor.

Proof should be corrected and returned within forty-eight hours to the Associate Editor. Reprints may be obtained from the printers, Tucker-Kenworthy Co., 501 S. La Salle St., Chicago, Ill., if ordered at the time proofs are returned.

Subscriptions, applications for single copies, communications with reference to advertising or other business, should be addressed to
H. A. FOX, Manager, 7 West Madison St., Chicago, Ill.

THE OPHTHALMIC ASPECTS OF THE MEDICAL AND SURGICAL HISTORY OF THE WAR.

The six large and profusely illustrated volumes furnishing our Medical History of the Civil War were published twenty-six years after peace was declared. In spite of the voluminous character of the publication little or nothing is said in it about eye surgery. Quite different will be the case, it is believed, with the Medical History now in preparation to record American participation in the present war. Before 1862-1865, ophthalmology was almost a negligible factor in military medicine; since then it has acquired an important place and will be given corresponding attention by the historiographer of the conflict now going on. It is the hope of the Division of the Surgeon General's Office in Washington, charged with the duty of collecting and preparing the material for this History, that within not more than five years after the war is ended a monograph will be printed and distributed that will, because of its early publication, add materially to its teaching value without detracting from its purely historical significance.

Already a complete account of the activities (to date) of those ophthalmic surgeons in service at home and overseas has been prepared for the Surgeon General by the Division of Head Surgery and a continuation of the record will be maintained, as indicated in the following brief account furnished by Lieut. Colonel Garrison.

The medicohistorical division of the Surgeon General's Office was organized by Special Order A. G. O. No. 196 in August, 1917, and has been occupied to date mainly in collecting the raw materials for the ultimate composition of this history and in devising ways and means for carrying out the plans of the same. After correspondence with Sir Walter Fletcher, Sir William Osler and others in England, it was decided to start at the point at which the English authorities had arrived, after a careful consideration of three years'

material, viz., to project a series of volumes in which the different themes are treated as well as considered, exhaustive monographs individualized by the actual authorship of those whose knowledge and experience in the different subjects are most authoritative.

In accordance with this plan, the following has been accomplished:

The interim reports and protocols by medical officers of the U. S. Army on duty as observers in England and France have been collected from the War College and the Council of National Defense; and a catalogue, giving brief abstracts of their contents, has been mimeographed and circulated.

Memoranda to medical officers in the field, requesting that they collect material for this history, have been printed and circulated.

Every effort has been made to collect the individual histories of the administrative divisions in the Surgeon General's Office, of the camps and of the base hospitals in the United States. Most of this material is now on hand.

Steps have been taken to secure continuity in these histories by means of annual historical reports (for administrative divisions); and by medical war diaries (for camps and base hospitals).

Thru a circular issued by the Hospital Division, the commanding officers of base hospitals have been authorized to direct preparation of subject indices of medical and surgical cases, with the tacit understanding that these become available for the use of the Historical Division at the end of the war; and to send in, as manuscripts or as reprints (either for record or publication), accounts of epidemics, group diseases or unusual medical and surgical cases occurring in the hospital, as part of this history. In this way much of the historical material will be actually assembled during the war; and the delays occasioned by the priority of pension claims will be to some extent obviated. In England, this plan is actually in process of realization, thru the publications of the Medical Research Committee (London).

A tabular statement, concerning the movement of preventable diseases, has been made by this board each week since September, 1917. These tables, based on the weekly telegraphic reports made to the Division of Sanitation, concerning thirty-one separate cantonments, will be a first instalment of the history of mobilization in its first year (September, 1917, to September, 1918), and should be available before the end of October, 1918.

Arrangements have been made to take care of the historical material relating to American participation on the western front, already accumulated in France, and for the accumulation of similar material in Italy (southern front).

Friendly relations have been established with the military authorities controlling the medical history of the war in Great Britain, France and Italy.

An advisory council, consisting of Col. Victor C. Vaughan, Col. William H. Welch and Col. William Mayo has been appointed to assist this board in passing upon applications for commission or employment, expansion of the board and other matters under advisement. Lt. Col. Casey Wood has been assigned Acting Director and placed in charge of the Division during the absence of the Director, Col. Champe C. McCulloch, Jr., now in Europe and engaged in overseas duties.

As a part of his duties the Acting Director has published (*Military Surgeon*, May, 1918) a short description of "A Few Civil War Hospitals" and later (*Ibid*, Sept., 1918) a "History of the Base Hospital at Camp Sherman."

CASEY A. WOOD.

"OPHTHALMIC OBSERVATIONS AND PROGRESS DURING THE GREAT WAR."

Already we have the results of ophthalmic work from the war reduced not only to the form of articles; but in the case of some of our confreres to whom has been given this magnificent opportunity for observation, we now have had donated to the advancement of ophthalmology, a number of books, in which the knowledge of the effects of wounds and injuries of the eye has

been markedly increased. Indeed we expect a plethora on this subject, for so many of our experts who are likewise adept with the pen, no doubt hold it as their ambition to write a book upon some aspect of their experiences.

The great Frenchman Lagrange, has now put forth two books, the one, his "Ophthalmoscopic Atlas of the War," the other his "Fractures of the Orbit." The first reviewed by our managing editor, on page 611 in our August number, the other by the writer in this issue.

In the August, and in the current number will be found the very complete essay by Lt. Col. Elliot of London on Quinin Poisoning, Its Ocular Lesions and Visual Disturbances, in which a well needed warning as to the excessive use of this medicament is given.

In these days of strenuous activity, when the nations are pushing their mechanical output of everything that can be of use to the armies and thus aiding in the rapid establishment of democratized civilization thruout the benighted countries of Europe, as well as at home, we have many men taken from trades and professions without mechanical training, and put in those in which brawn is a factor and in which they have not been educated to tools and machinery; this more or less unskilled labor has accidents comparable to those which are the results of gunshots.

Thus it is that at this time the publication of this form of literature is not only a benefit to the surgeon who is at war, and his patients the soldiers; but to the oculist who takes care of those industrial soldiers, who are at dangerous trades, necessitated by our enormous commerce and the feeding and supplying of our armies.

We may look forward to other books on the same subject, to other books upon hygiene, upon the army diseases of the eyes, upon the subject of hemeralopia and upon the relation of the eyesight to occupations, written by our confreres who have this undisputed opportunity to observe masses of apparently healthy men under unusual and strange surroundings. These observations will later be of great value in times of peace as they are now in times of conflict. H. V. W.

BOOK NOTICES.

The Indian Operation of Couching for Cataract, Incorporating The Hunterian Lectures, by **Robert Henry Elliot,** M. D., B. S., London, Sc. D. Edin., F. R. C. S., Lieut.-Col. I. M. S. (Retired). With 45 illustrations. Paul B. Hoeber, 67 and 69 East Fifty-ninth street, New York City. 1918. Price $3.50.

Very few American ophthalmic surgeons have seen cases in which the lens has been couched for cataract. Indeed dislocations of the lens into the vitreous, be they operative, traumatic or incidental to disease, are extremely rare in ordinary private practice.

In India, however, the conditions are different, owing to the pernicious activities of the "rawals" or "vaidyans," the itinerant Indian charlatans who practice their nefarious trade at times, being otherwise farmers, fishermen or even beggars. As with the charlatans of the white races, they travel from place to place, not waiting for the end results, but moving along before vengeance overtakes them. The craft of couching in India is hereditary, the principles being handed from father to son by word of mouth, or by practical instruction.

These Indian couchers do both the anterior and the posterior operations, one thru the cornea and the other thru the sclera. They do both depression and reclination. Their filthy tools, habits and the practice of putting on fowl's blood or other septic alleged medicaments leads in many cases to panophthalmitis; and as Lt. Col. Henry Smith says, "even the best cases if followed long enough end in absolute blindness."

The author reports 780 cases. No table is more interesting than that which gives the state of vision when the patients came under observation. In only 10.59 per cent was the vision 1/3 and upward. In another, 11.05 per

cent the vision was 1/4 to 1/10, in 9.64 per cent it was 1/10 to 1/50, and in 7.05 per cent it was a finger-count at 2 feet or less. The figures given refer in each case to the vision corrected with lenses. If every case that got a vision of 1/10 and upward be considered a success, the coucher can claim 21.64 per cent. Again, if anything from 1/10 vision to the ability to count fingers close to the face be counted as partial success, the figure for this class is 16.69 per cent. This is very much more liberal treatment than would be accorded to the cataract statistics of any modern surgeon.

A further light is thrown upon the above figures by a study of the table showing the duration of vision after couching. Of the 45 successful cases, 23 of them, or more than 50 per cent, had been couched less than two years before; 9 more had been couched between two and three years, and 11 from three to ten years. In two, this detail was unmarked. The great preponderance of short histories in the cases of successful operation is significant.

Chapter 5 and following is from the Hunterian Lectures delivered before the Royal College of Surgeons of England on February 19th and 21st, 1917, giving description of 54 globes and many photographic illustrations of these sections, made by Mrs. Elliot. The author had the assistance of a number of eminent surgeons and helpers in the collection of material and the preparation of specimens.

The book also contains a number of reproductions of pictures from ancient authors. It is very interesting reading and especially valuable in regard to the pathologic anatomy. This is a kind of work that could only be written by a man of rich experience, and certainly can hardly be added to or reproduced for a long time. H. V. W.

Les Fractures de l' Orbite par Projectiles de Guerre. Félix Lagrange, Professor á la Faculte de Médecine de Bordeaux. 8vo, pp. 222, 77 figures in the text and 6 plates. Paris, Masson et Cie, 120, Boulevard Saint-Germain. 1917. Price 4 francs.

This is a paper covered volume of 222 pages, one of the compendiums of medicine and surgery of the war, of which 16 have been published, 2 are in press and 3 in preparation, all having to do with the medical treatment or surgery of the war.

These treatises are of present actual value, altho they will be subject to changes and improvements after the war, when the work of the ambulance corps, the hospital and the laboratories will be of avail. These memoirs are now of great practical importance and of particular interest to the general surgeon as well as the ophthalmologist, as is the present volume on Fractures of the Orbit, dealing as it does not only with the actual fractures, destructions and displacements of the bony and soft parts, but with the effects of these injuries upon the eye.

This is a living book. It was not written in a library but mostly in the hospital with the collaboration of the author's assistants; having the opportunity of observing the vast number of 609 such cases out of 2,554 war injuries, showing a very large preponderance of orbital fractures. Of these head cases, 397 i. e. 65 per cent were healed with conservation of the globe; 212, 34.5 per cent with its destruction; 105 or 17.2 per cent did not have any ocular lesion, whereas 292 or 47.9 per cent, the eye was injured or destroyed.

The book has a short chapter of history and another on the anatomy and surgical physiology, and not only takes up the fractures of the bones and the injuries to the soft parts, but deals with all the injuries of the eye and the vision, that may come from the effects of shot wounds.

His conclusions give a fair idea of the contents and are herewith shortly abstracted.

First.—Attention is called to the fact that the fractures of the cranium by projectiles from firearms do not show irradiation, nor do they show fracture by contracoup, contrary to many met with in civil life, where the sphenoidal fissure, the optic canal and

the structures contained therein may be indirectly affected. Fractures of the orbital vault in army surgery are always found to be direct.

Second.—The eye is often implicated, not only by direct injury but by concussion of the tissues; showing lesions visible with the ophthalmoscope in the form of hemorrhagic injuries of the choroid and retina. In some cases where sight is affected, no ophthalmoscopic signs may be present, due to a commotion of the retina.

Third.—Projectiles may pass by the eye without directly injuring it and yet a fragment of the bone may contuse the globe.

Fourth.—There are certain well defined laws which have been determined as the result of the examination of these cases which show with exactitude the kind of injury that has been produced by certain forces.

Fifth.—When the choroid and retina are torn, the resultant intraocular hemorrhage does not produce the classical retinitis proliferans, but a chorioretinitis of a typical form. The total cutting of the optic nerve, which is often seen in war but is unusual in civil practice, produces this proliferating chorioretinitis of a maximum type.

Sixth.—There is a marked absence of partial scleral ruptures produced by depression of the equator. The projectiles striking the eye tangently make contact lesions. They contuse the eye directly, others destroy it. There is no place in military ophthalmology for scleral ruptures at the ciliary region, and subconjunctival luxations of the lens. They do not exist.

Seventh.—Hematoma of the optic nerve is not carried into the ocular cavity. Recent hematoma therein is secondary, due to slow migration of the pigment.

Eighth.—This work treats of the surgical repair of the orbit, especially with fatty and cartilaginous grafts, the latter a decidedly new procedure and of pronounced importance. Two points strike one, the use of "colmatage," which consists of dissection of the conjunctiva over the ciliary region between the insertion of the recti muscles, and cauterization of all of the region of the Schlemm's canal, for detachment of the retina. This procedure obliterates the lymphatic canals and results in all sorts of experimental glaucoma and in three cases, out of 135, has resulted in complete cure. In 8 others, an amelioration. The other point was the question of sympathetic ophthalmia which the author considers very rare, having observed but five cases out of 2,554 ocular globe injuries. Early enucleation is its preventive. H. V. W.

Headaches and Eye Disorders of Nasal Origin, by **Greenfield Sluder**, M. D. With 115 Illustrations. St. Louis. C. V. Mosby Company. 1918.

Most of the cases of recurrent headaches that the ophthalmologist sees are due to eye strain, those of the internist to toxemias, those of the syphilographer to syphilis, and quite a proportion of those of the neurologist to simple nerve strain. Now we find that a certain class of headaches, even those that may be produced by the use of the eyes, are ascribed to disease of the sphenoidal or ethmoidal sinus, and are only to be relieved by giving free drainage and ventilation by treatment or operation.

It must be remembered, however, that headache *per se*, is only a symptom, and that various causes may be acting at the same time. The removal of all or even of only one factor may relieve the symptom; and to the therapeutic measure used at the time may be ascribed the cure, and to the part involved, the cause.

In these days of highly specialized specialists, such is indeed the tendency. The true physician, be he specialist or a general supervisor of health, must remember the complexity of the causes of headaches, and the complicity of this symptom in a very large proportion of ills to which humanity is heir.

Retournos a nos moutons; Sluder and his collaborator, John Wright, illustrate very well the involvement of the superior accessory sinuses by pathologic processes, and their effect upon the production of the nerve pain which

we call headache. The author does not deal with the suppurative sinus directly. He considers the three varieties of nasal disease, which have as symptoms headache, and more or less eye disorder, to be:

First—Closure of the frontal sinus without suppuration, i. e.: a vacuum frontal headache. The absolutely diagnostic symptom of closure of the frontal sinus without suppuration is Ewing's sign; a tender spot at the upper inner angle of the orbit at the point of attachment of the pulley of the superior oblique, and internal and posterior to it.

Second—Nasal ganglion neurosis, i. e.: that of the sphenopalatine or Meckel's ganglion, which while it lies deep in the sphenomaxillary fossa or close to the sphenopalatine foramen, is not always deep in the bone; but may be so close to the nasal membranes or paranasal cells as to be implicated by nasal inflammation, enlargement of the cavernous tissue, osteitis or enlargement of the bony structures or pressure from malformations

Third—Hyperplastic sphenoiditis.

As to treatment it is sometimes astonishing to see what may be accomplished by the simple application of astringents, 2 p. c. silver nitrate solution, 5 per cent carbolic acid in alcohol over the region of the outlet of the sinuses and over the region of the nasal ganglion and the vidian nerve.

The severest pain of photophobia, glaucoma, iritis, corneal ulcers, phlyctenular keratitis, interstitial keratitis may be stopped by anesthesia of the nasal ganglion, i. e.: strong cocain solution applied thru the nose posterior and above the middle turbinal.

Sluder goes on in detail, in the various chapters, to point out the explanation of the relation of nasal to optic disorders; which, as a rule, is a hyperplastic bone process; the mode of operation being the narrowing of the bony canals thru which the respective nerves pass, i. e.: the optic canal with the optic nerve; the foramen rotundum transmitting the maxillary and the vidian nerves. Certain rather far-fetched deductions are made, even apparently showing the relation of the sphenoid to the Eustachian tube with consequent deafness and tinnitus. Most of the permanent results of treatment are shown by him to be accomplished only by intranasal operations, varying from removal of the midturbinal to actual excision and curettement of the walls of the various sinuses.

Sixty-seven pages of the book are given up to case histories, apparently showing the relation of the nasal structure to the eye, and to headache or the symptoms connected therewith. The book is well printed and illustrated, and is of decided value to the ophthalmologist as well as to the rhinologist.

H. V. W.

CORRESPONDENCE.

A NOTE FROM LABRADOR.

[When the Hun is eliminated the perpetual war with nature and disease must not be forgotten. The development of courage and capacity, strikingly characteristic of medical war service, goes on in times of peace along the front lines of civilization. Reminders of this are so important that we have obtained the consent of the writer to publish extracts from a letter written to the late Col. Todd, in ignorance of his death; which recently came to the hands of the Editor.]

"In times of peace the only boat which plies between St. John's and this place makes a fortnightly trip; it rarely happens that we can connect with the boat when coming from the United States. Now we are short of everything. This only boat is running on the southern route to New York, and her cabin has been taken out to make room for freight. The boats now in service on this coast are old sealers, and dirty for women to travel in; but I have never heard a complaint from any of our volunteer women workers. We are short of doctors, nurses, and supplies. Our mission schooner, with our summer food and hospital supplies, is being held up at Boston. Whether this be on account of the Hun submarine menace, or because the U. S. is

so exacting—and properly so, in regard to granting release of shipments to foreign ports, we are unable to learn. However, we are accustomed to making shift, and we shall, no doubt, pull through, even should the schooner encounter the Hun en route. We are very busy; therefore, as we learn here to be busy, we are in no sense disappointed.

Dr. Grenfell has just left here on his hospital ship, on his mission of mercy in the North. It has required sustained courage in this gifted and best of men, to work as he has done on this coast for twenty-five years. Only those who have worked with him can understand what that work means on this angry coast. This is my seventh summer as a volunteer worker with Grenfell. I should have been ashamed of myself if I had remained in the land of pure delight this summer, when I knew of the stress here. It would have been like going back on a friend in trouble. After all what do we live for if it be not to make life less difficult for others?"

Sincerely yours,

JOSEPH A. ANDREWS.

St. Anthony, Newfoundland.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. As these columns go to press on the 30th of the month contributors should send in their items by the 25th. The following gentlemen have consented to supply the News Item Editor with the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, La Fayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala, City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. Geo. M. Waldeck, Detroit. It is desirable that this staff shall be enlarged until every city of importance in the United States shall be covered, as well as all foreign countries. Volunteers are therefore needed and it is hoped that they will respond promptly to this call.

DEATHS.

William A. Dietrich, Chattanooga, Tennessee, aged 60, died at the home of his sister, in St. Joseph, Michigan, about August 13th.

Dr. J. M. Ray of Louisville, Ky., died Oct. 11th.

PERSONAL.

Dr. John A. Donovan, of Butte, Montana, has regained health and resumed his practice October 1st.

C. R. Dufour, M. D., has been appointed Chairman of the Public Health Committee, by the President of the Washington Chamber of Commerce.

Dr. Clark W. Hawley, of Chicago, was thrown from his bicycle recently and sustained a painful fracture of the nose.

Argañaraz of Buenos Aires has described methods of recording nystagmic movements, with experiments on rabbits, by means of a modified Buys' nystagmograph.

The Kentucky State Medical Association has elected Dr. D. M. Griffith, of Owensboro, Kentucky, delegate to the next meeting of the American Medical Association.

Daniel M. Velez, M. D., Ophthalmologist of Mexico City, Donato Guerra 11, was a recent visitor to the Ophthalmological Clinic at Marquette University Medical School, Milwaukee, Wisconsin.

MILITARY.

Lieut. Colonel Nelson M. Black, of Milwaukee, is now in active service somewhere in France.

Capt. Frank R. Spencer, of the Medical Relief Corps, Boulder, Colorado, has been assigned to Camp Lewis.

Dr. H. H. Stark, of El Paso, Texas, has accepted a Captaincy in the M. R. C., and will be stationed at the Base Hospital, Camp Travis, Fort Sam Houston.

Major P. J. H. Farrell, of Chicago, has recently arrived in France, from Camp Travis, Texas. There are with him, engaged in overseas service, nineteen nephews, two sons and a son-in-law.

Capt. James Melville Shields, of Grand Junction, Colo., is now in Italy with Base Hospital 102, American Expeditionary Forces. This hospital unit was organized at the Tulane University, New Orleans, and financed by a patriotic lady of that city.

The change of address of the following Ophthalmologists from New Orleans is

noted: Capt. Arthur Whitmire, Camp Gordon, Georgia; Lieut. John F. Dunn, Camp Greenleaf, Ft. Oglethorpe, Georgia; Lieut. Geo. J. Taquino, Camp Greenleaf, Ft. Oglethorpe, Georgia.

Capt. James M. Patton has been promoted to Major, and will assist Major A. C. Stokes, also of Omaha, in command of Hospital Unit No. 49. The base hospital in the care of this unit has been divided into two sections, known as 49, and 49A, and Major Patton is in charge of the former.

Maj. Thos. A. Woodruff, stationed at Camp Meade, was recently in Chicago on a visit.

SOCIETIES.

The Pacific Coast Oto-Ophthalmological Society had a very successful and profitable meeting in Salt Lake City, August 12th and 13th. The hosts were voted royal entertainers and everyone went home singing the praises of Salt Lake. Dr. Cullen F. Welty of San Francisco was elected President, and Dr. Aaron S. Green of San Francisco was elected Secretary. San Francisco was selected as the next place of meeting.

MISCELLANEOUS.

The translation of the American Encyclopedia of Ophthalmology, edited by Dr. Casey A. Wood, into Spanish is proposed.

By the will of the late Marie Louise Tillotson, the New York Eye and Ear Infirmary was bequeathed $5,000, and the Society for the Relief of the Destitute Blind was left $10,000.

Two midwives were recently fined $10.00 each, by Judge Frye of Illinois, for failure to observe the requirements of the Act for the Prevention of Ophthalmia Neonatorum.

In a decision granted by the Supreme Court, August 14th, in the case of W. A. Beardsley versus Drs. Fred E., and John Ewing of Kenmare, in which damages were claimed on account of alleged mistreatment in a case of disease of the eye, the decision of the District Court is said to have been affirmed which awarded the complainant $7,500 damages.

The Medical School of the University of Minnesota offers teaching fellowships for graduate work in Internal Medicine, Surgery, Obstetrics, Pediatrics and Ophthalmology and Oto-Laryngology. These fellowships cover a period of three years' study, and lead to the Doctor's degree in Science or Philosophy. They are under stipends of $500, $750, and $1,000 for each of the successive years.

The U. S. Employes' Compensation Commission, Bureau of Standards, has issued specifications covering tentative standards for head and eye protection prepared in conjunction with the Safety Engineers of Federal Industrial Establishments. It is believed that the Bureau will be very glad to receive suggestions from ophthalmologists concerning the establishment of such standards.

"A conference under the auspices of the national subcommittee on welfare work of the committee on labor of the Advisory Commission of the Council of National Defense has reported, thru Samuel Gompers to Secretary William B. Wilson of the Department of Labor; that at its last meeting the Committee recommended that medical examination of workers be one of the functions of the government labor recruiting agency; recommending also the establishment of a central examining board to issue cards indicating the health of workers, and classifying them according to physical fitness." (Journal of the A. M. A.) The advisability of the formation of such a board for examination of employes was suggested by Dr. V. A. Chapman of Milwaukee, in a paper presented before the American Academy of Ophthalmology and Oto-Laryngology at Pittsburgh, October 30, 1918.

The importance of differentiating between those who are dangerously color-blind—that is, unable at all times to distinguish between red and green—and those who are only slightly color-blind, is brought out in a recent study conducted by the U. S. Public Health Service, and reported in Public Health Bulletin No. 92.

The following classes are regarded as dangerously color-blind and therefore to be excluded from positions in which they would be required to read colored signal lights: (1) those who are able to see but three or less colors in the spectrum, (the normal person sees six or seven); (2) those who see more than three colors in the spectrum, but who have the red end so shortened as to prevent the recognition of a red light at a distance of two miles; and (3) those with a central scotoma (that is, a blind or partially blind area in the field of vision) for red and green.

It was concluded that this class of persons could be distinguished from those harmlessly color blind by the use of the Edridge-Green color lantern, which was found preferable to colored yarns.

Another feature of the investigation was the study of the prevalence of color blindness. Excluding those able to distinguish five colors in the spectrum, it was found that color blindness occurs in about 8.6 per cent of men and 2.2 per cent of the women. Color blindness of a degree dangerous in occupations requiring the recognition of colored signal lights was found to occur in about 3.1 of men and 0.7 per cent of women.

OPHTHALMIC LITERATURE

Under this head continuing the "Index of Ophthalmology" heretofore published in **Ophthalmic Literature** will be found the subjects of all published papers received during the last month, that bear to an important extent upon ophthalmology. The subject is indicated rather than the exact title given by the author. Where the original title has been in a foreign language it is translated into English. The journal in which the paper is published will indicate the language of the original.

The names of the different journals are indicated by abbreviations which generally correspond to those used by the **Index Medicus**, the **Journal of the American Medical Association**, and the **British Journal of Ophthalmology**. We will from time to time publish the list of ophthalmic journals, with the abbreviations used for each. Often a single letter discriminates between journals published in different languages. Thus "Arch. of Ophth." refers to the Archives of Ophthalmology, published in English; "Arch. d'Opht.," indicates the French Archives d'Ophtalmologie; "Arch. de Oftal." refers to the Archivos de Oftalmologia Hispano-Americanos, while "Arch. di Ottal." indicates the Italian Archivio di Ottalmologia.

In this index of the literature the different subjects are grouped under appropriate heads; so that all papers bearing on the same, or closely related subjects, will be found in one group. The succession of the groups is the same from month to month, and identical with that of the Digest of the Literature. Where a paper clearly refers to two subjects that belong in different groups, it will be noticed in both groups.

Each reference begins with the name of the author in heavyface type. This is followed by the subject of his paper. Then in brackets a number with (ill.) indicates the number of illustrations, or a number with (pl.) the number of plates illustrating the article, (col. pl.) indicates colored plates. (Abst.) shows that it is an abstract of the original article. (Bibl.) tells that the paper is accompanied by an important bibliography. (Dis.) means that the paper was read before some society and gave rise to a discussion which is published with it.

The "repeated titles" may render accessible the essential part of a paper, the original of which could not be consulted. These give (in brackets) after the author's name the volume and page of this department of "Ophthalmic Literature" where the title of the paper will be found; and then the journal, volume, and page where the translation or abstract is published.

It is desired to notice every paper as soon as possible after it is published. Readers will confer a favor by sending titles they notice have been omitted, with journal and page of publication; and of their own papers, sending either a copy of the journal in which each appeared, or a reprint. These should be sent as soon as possible to 318 Majestic Building, Denver, Colorado.

METHODS OF DIAGNOSIS.

Bachstez, E. Estimation of "Sellar" Length in Roentgen Image. (1 ill.) Zeit. f. Augenh., v. 36, 62.

Beck, E. G., and Smith, E. D. Stereoscopic Roentgenograms. Amer. Jour. Roent., v. 5, p. 369.

Bruns, H. D. Methods of Diagnosis in Ophthalmology. New Orleans Med. and Surg. Jour., v. 71, p. 145.

Eppenstein, A. Study of Field of Vision and Blind Spot with Prism Apparatus. Klin. Monatsbl. f. Augenh., v. 60, p. 620.

Ezell, H. Detection of Feigned Blindness. Jour. Tenn. State Med. Assn., v. 11, p. 150.

Fleischer, B. Campimetry after Bjerrum. Klin. Monatsbl. f. Augenh., v. 60, p. 265.

Gleichen, A. Theory of Acuteness of vision. (17 ill.) Graefe's Arch. f. Ophth., v. 93, p. 303.

Gullstrand, A. Macula in Red-free Light. Klin. Monatsbl. f. Augenh., v. 60, p. 289.

Koeppe, L. Observations with Nernst Lamp and Corneal Microscope. (Bibl.) Graefe's Arch. f. Ophth., v. 97, p. 1.

Microscopic Appearance of Macula with Gullstrand Nernst Lamp. (5 ill.) Graefe's Arch. f. Ophth., v. 95, p. 282.

Lecha-Marzo, A. Tear Sign of Death. Abst. Jour. A. M. A., v. 71, p. 1009.

Pichler, A. Simulated Contraction of Field. Graefe's Arch. f. Ophth., v. 94, p. 227.

Stenvers, H. W. Roentgenologic Remarks on Work of van der Hoeve and de Kleijn. (5 ill.) Graefe's Arch. f. Ophth., v. 95, p. 95.

Terrien, F. Factitious Diplopia. Paris Méd., v. 8, p. 462. Abst. Jour. A. M. A., v. 71, p. 859.

Vogt, A. Color of Macula. Klin. Monatsbl. f. Augenh., v. 60, p. 449.

Vertical Linear Pigmentation Observed in Retina of Young in Red-free Light. (1 col. pl.) Klin. M. f. Augenh., v. 60, p. 47.

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Gjessing, H. Idiosyncrasy for Mercury. (Bibl.) Klin. Monatsbl. f. Augenh., v. 60, p. 382.

Hippel, E. v. Treatment of Eyes and Lids with Radiation. (2 tables.) Graefe's Arch. f. Ophth., v. 95, p. 265.

Jackson, E. Daturin, A Cycloplegic Mydriatic. Amer. Jour. Ophth., v. 1, p. 673.

Kudrnac, J. Treatment of Pneumococcic Infections of Eye with Optochin. Deut. Med. Woch., 1917, No. 3. Clin. Opht., v. 22, p. 619.

Lundsgaard, K. K. K. Disappointing Results from Parenteral Injections of Milk. Hospitalstidende, June, 1918, p. 826.

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Seidel, E. Light in Diseases of Eye. Graefe's Arch. f. Ophth., v. 93, p. 356.

Szily, P. v., and Sternberg, A. Bacteriotherapy and Chemotherapy in Ophthalmology. Klin. Monatsbl. f. Augenh., v. 60, p. 219.

Tuberculin In Diseases of Eye. New York Med. Jour., Sept. 7, 1918, p. 428.

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Boegehold, H. Value of Zeiss' Punktal and Katral Glasses. Klin. Monatsbl. f. Augenh., v. 60, p. 641.

Brugh, J. P. van den. Chronic Headaches an Asthenopic Symptom. (Dis.) Amer. Jour. Ophth., v. 1, p. 677.

Emerson, L. Duty of Family Physician to Patients Suffering from Headache, and Eyestrain. Jour. Med. Soc., New Jersey, v. 15, p. 303.

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McClelland, E. S. Variable Hyperopic Astigmatism in Children. Med. Rec., v. 94, p. 276.

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Rochon-Duvigneaud, A., and Merigot de Treigny, P. Comparative Morphology of Eye in Emmetropia, Hypermetropia and Myopia, Methods of Treatment. (2 ill.) Ann. d'Ocul., v. 155, p. 309.

Steiger, A. Myopia. Zeit. f. Augenh., v. 36, p. 127.

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Herrman, C. Headshaking with Nystagmus in Infant. Amer. Jour. Child. Dis., v. 16, p. 180.

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Kunz, L., and Ohm, J. Pictures of Ocular Movements. (30 ill.) Graefe's Arch. f. Ophth., v. 93, p. 237.

Lemere, H. B. Oculomotor Reaction to Labyrinth Stimulation. Jour. A. M. A., v. 71, p. 901.

Loeb, C. Convergent Strabismus Treated by Atropin and Glasses. Hereditary Strabismus. Amer. Jour. Ophth., v. 1, p. 668.

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Murray, W. R. Vestibular Apparatus and Relation to Aviation. Jour.-Lancet, v. 38, p. 155.

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Smith, E. T. Treatment of Squint. Med. Jour. of Australia, Aug. 17, 1918, p. 135.

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Stahli, J. Fleischer's Ring in Keratoconus; a New Type of Pigmentation in Corneal Epithelium. (7 ill.) Klin. M. f. Augenh., v. 60, p. 721.

Uhthoff, W. Typical Case of Band-like Opacity of Cornea. (7 ill.) Klin. M. f. Augenh., v. 60, p. 11.

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Kahn, R. H. Physiologic Pupillary Segment. (3 ill.) Graefe's Arch. f. Ophth., v. 95, p. 73.

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Fuchs, E. Luetic Choroiditis. (8 ill. Bibl.) Graefe's Arch. f. Ophth., v. 97, p. 85.

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Faith, T. Sympathetic Ophthalmia. Amer. Jour. Ophth., v. 1, p. 679.

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